

Anyatej oligoszacharidok protektív hatásának vizsgálata bakteriális endotoxinnal indukált lázválaszban

Gárdos Bíbor

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PTE ÁOK Transzlációs Medicina Intézet, Termofiziológia Tanszék

2025.04.24. Pécs

Bevezetés

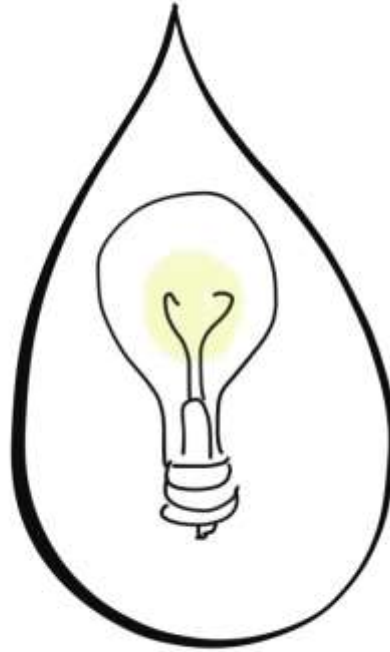
Anyatej



Biológiailag aktív anyagok



morbidity, mortality
reduction



Gram-negative
bacteria

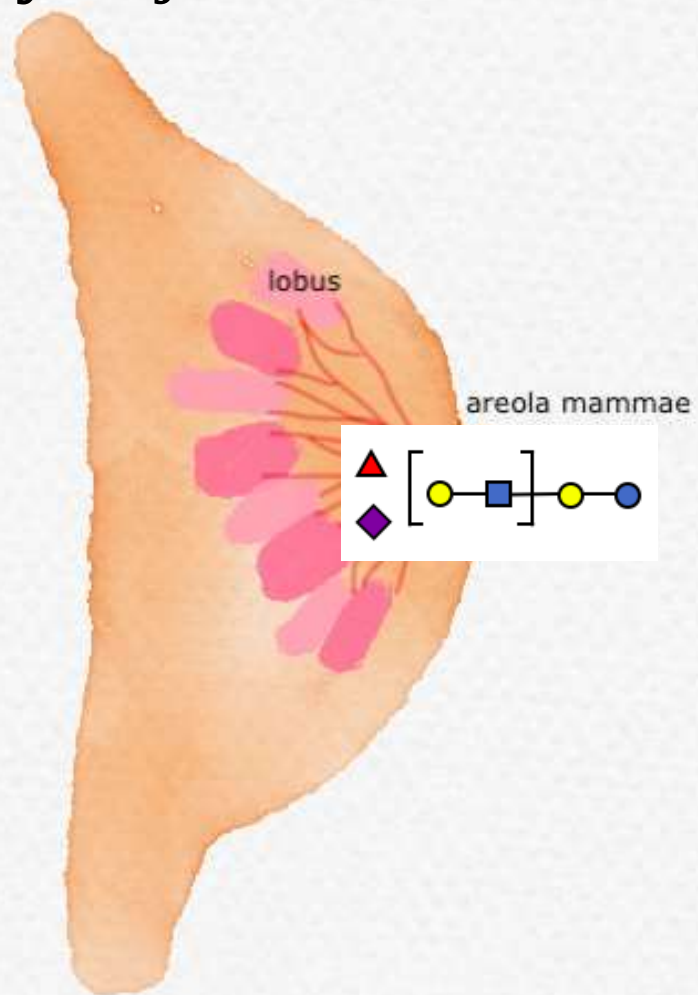


Invasive bacterial infection

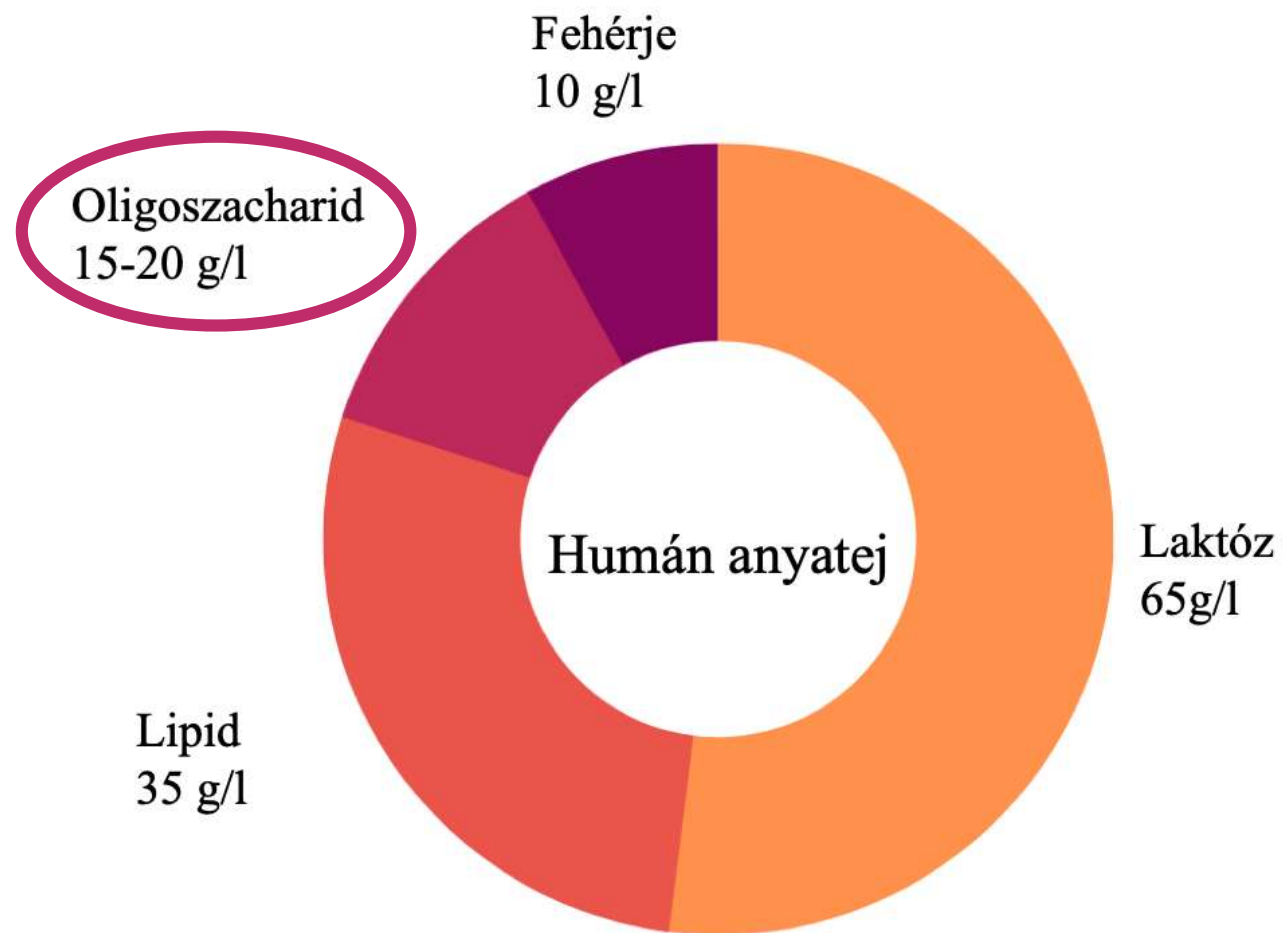


Newborn mortality

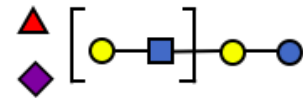
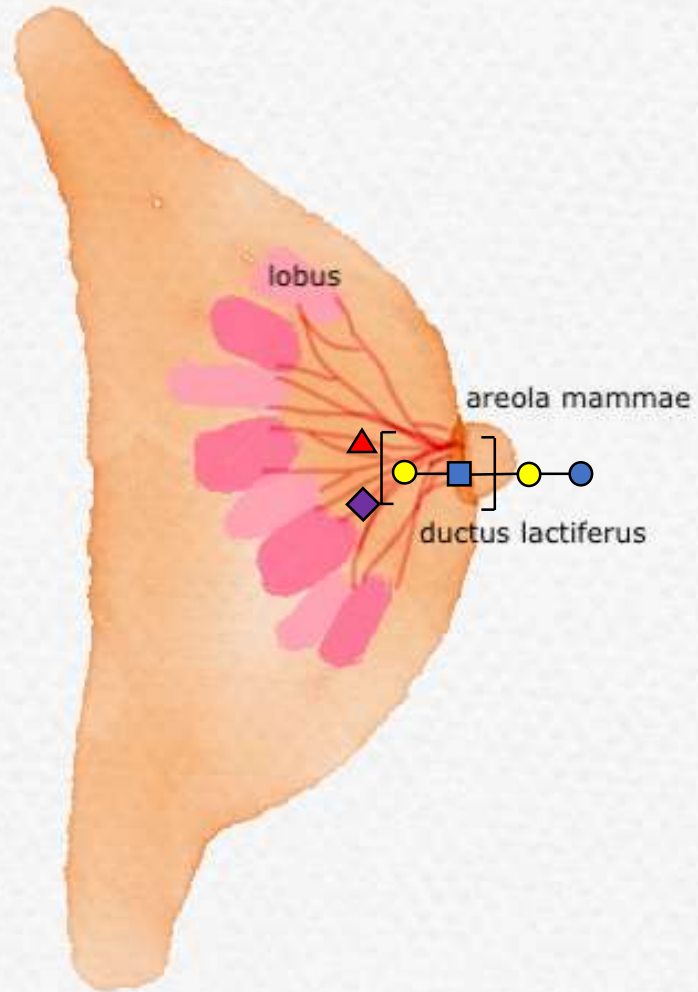
Anyatej összetétele



saját illusztráció

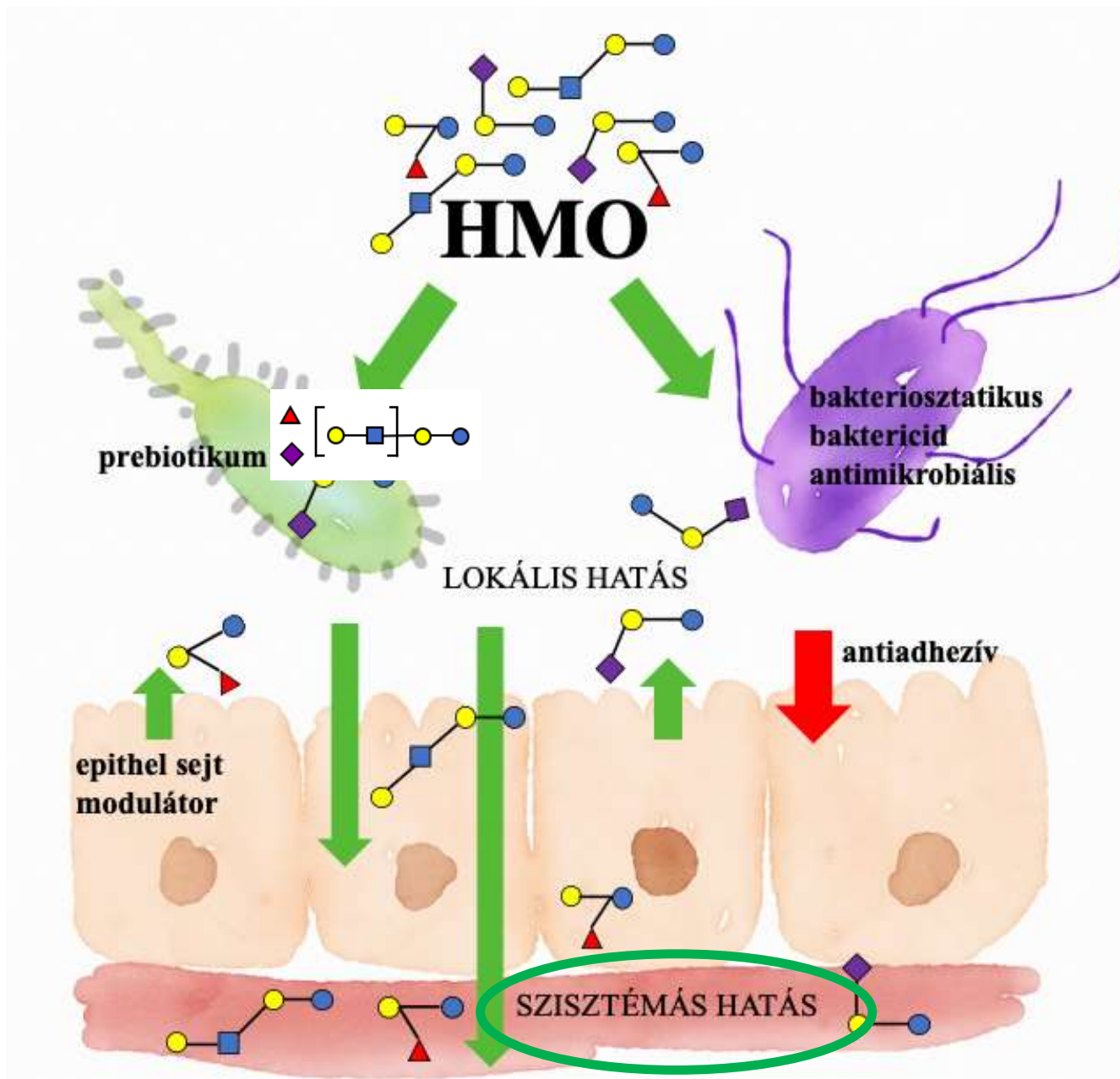
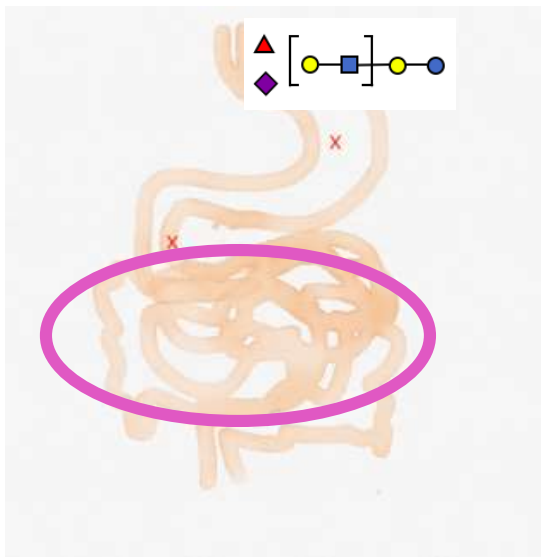


HMO(Human Milk Oligosaccharide)



- Galaktóz
- Glükóz
- ▲ Fukóz
- N-acetil-glükózamin
- ◆ Sziálsav

HMO-k hatásai



Hipotézis

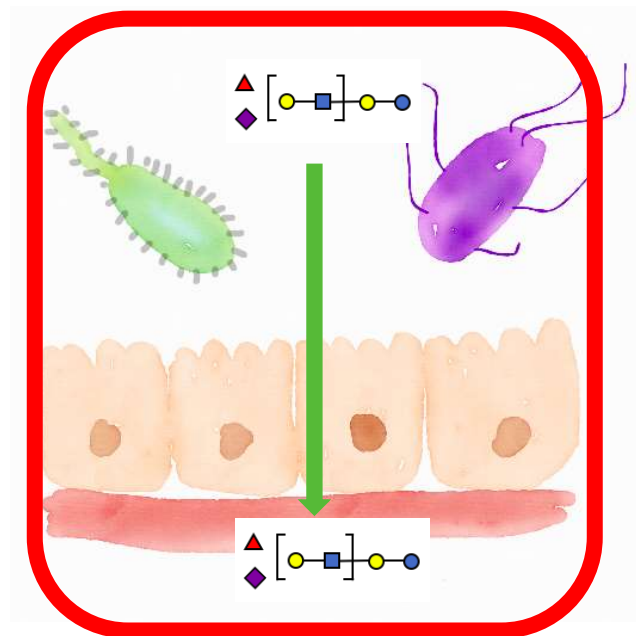
Anyatej



Biológiailag aktív anyagok



HMO-k



Gram-negatív
baktérium



Endotoxin / LPS



?



Invazív bakteriális fertőzés

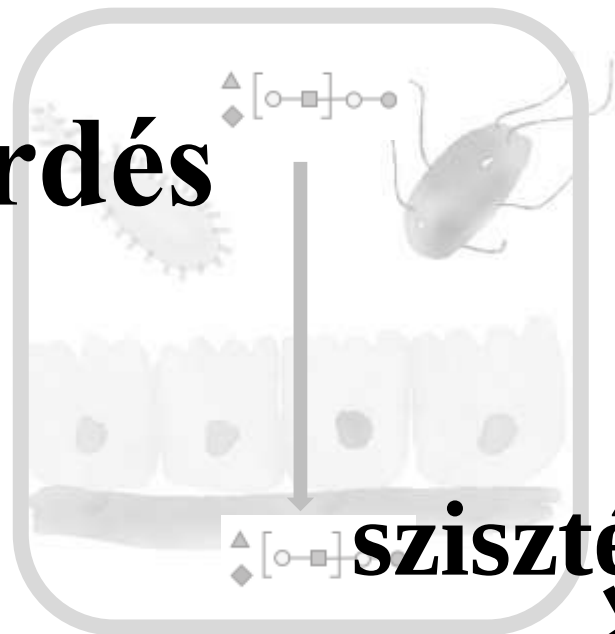
Hipotézis

Elsődleges kérdés

Anyatej



Biológiaiag aktív anyagok



Gram-negatív
baktérium



szisztémás (intraperitonealis)

Endotoxin / LPS



szisztémásan (i.p.)

?

HMO

Invazív bakteriális fertőzés

Testhőmérséklet

Eredeti módszer szisztémás hatás modell



2 hét
szoktatás

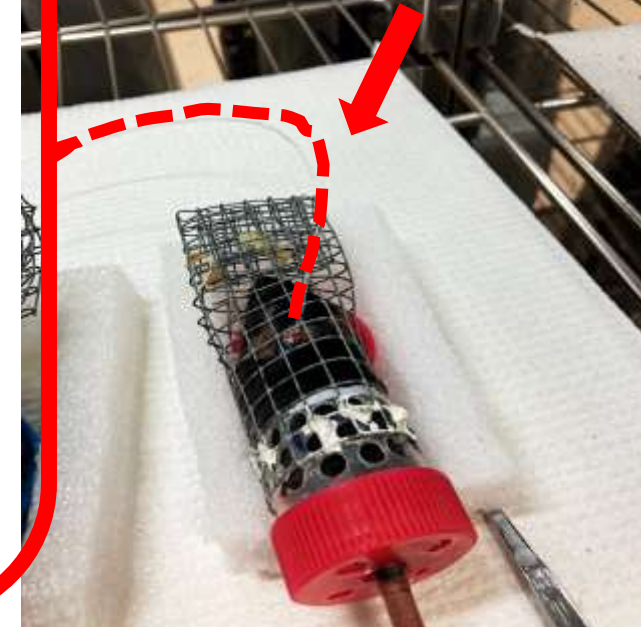
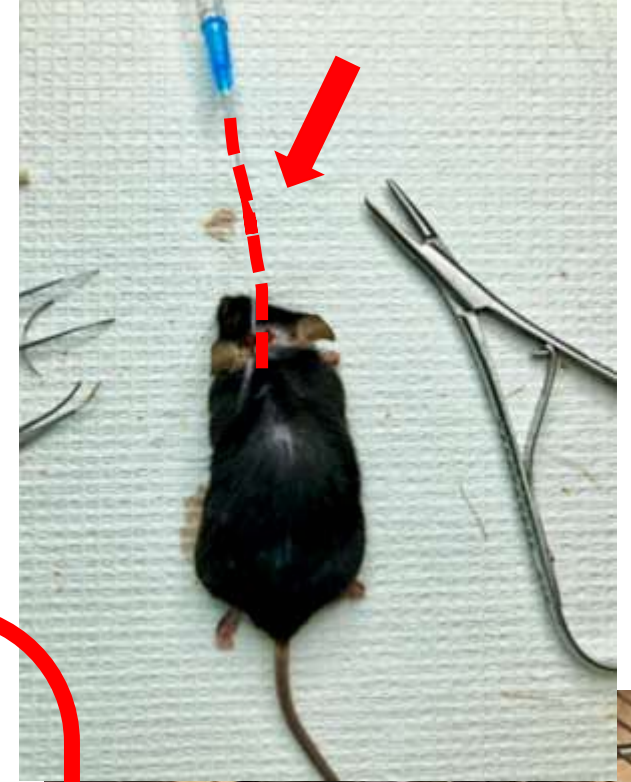
Intraperitoneális
műtét

Kísérlet

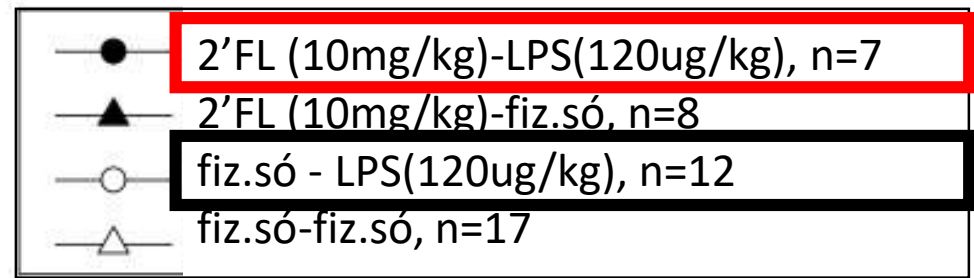
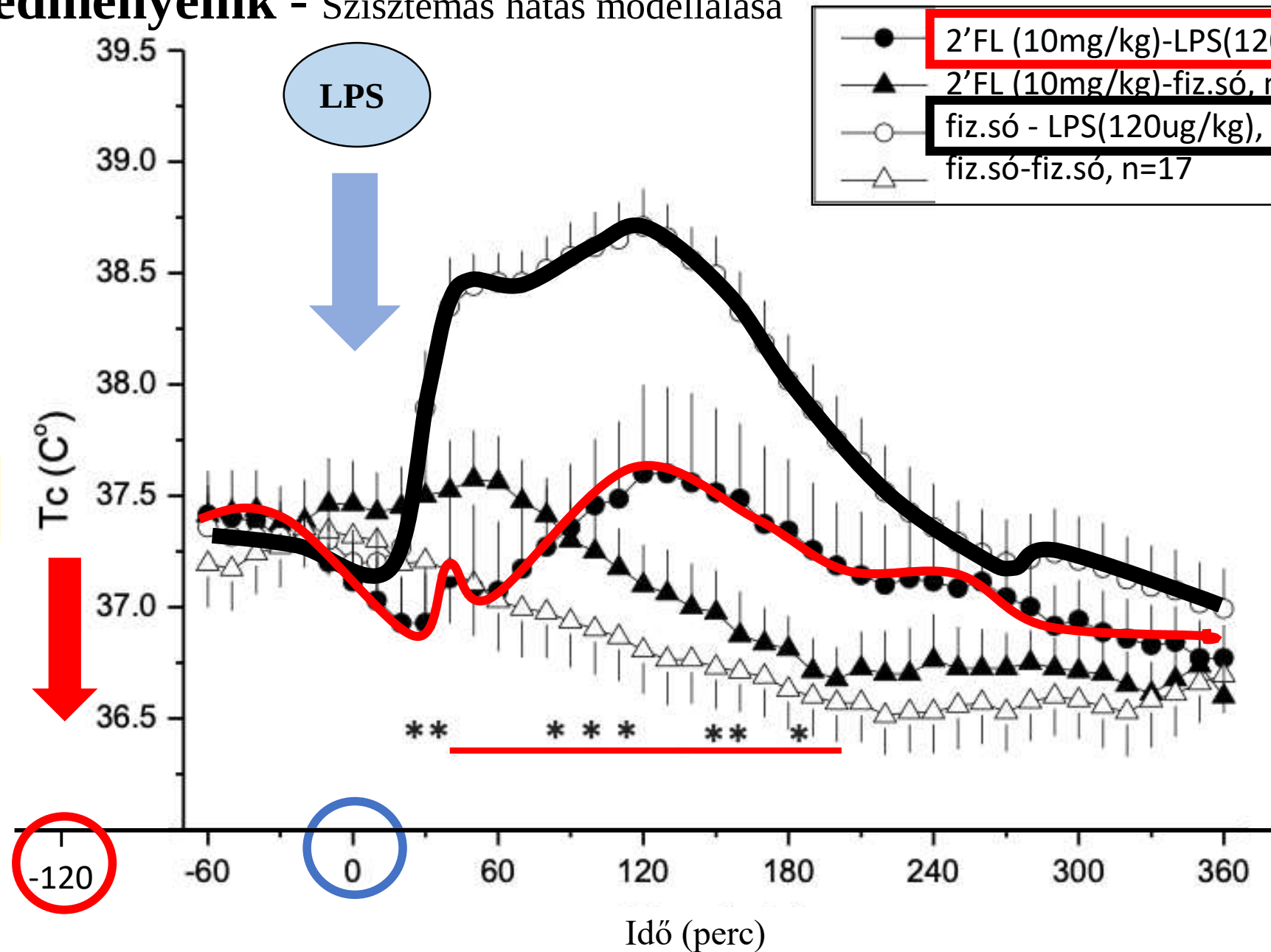
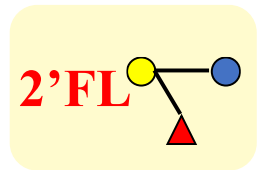
HMO ip.

2 h

LPS ip.



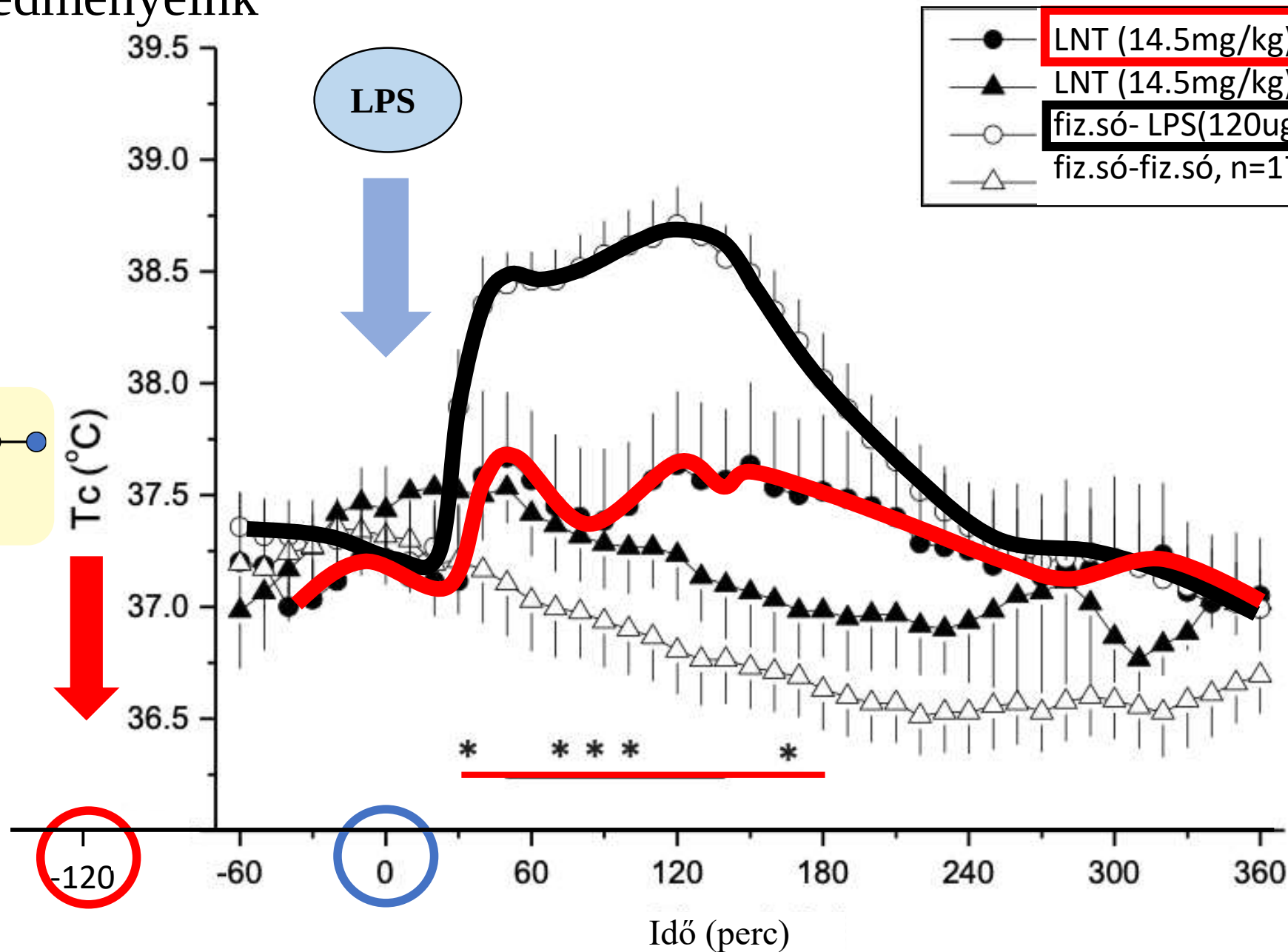
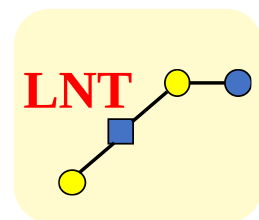
Korábbi eredményeink - Szisztémás hatás modellálása



*p< 0.05
** p<0.01
** p<0.001
2 utas ANOVA

T=33°C

Korábbi eredményeink



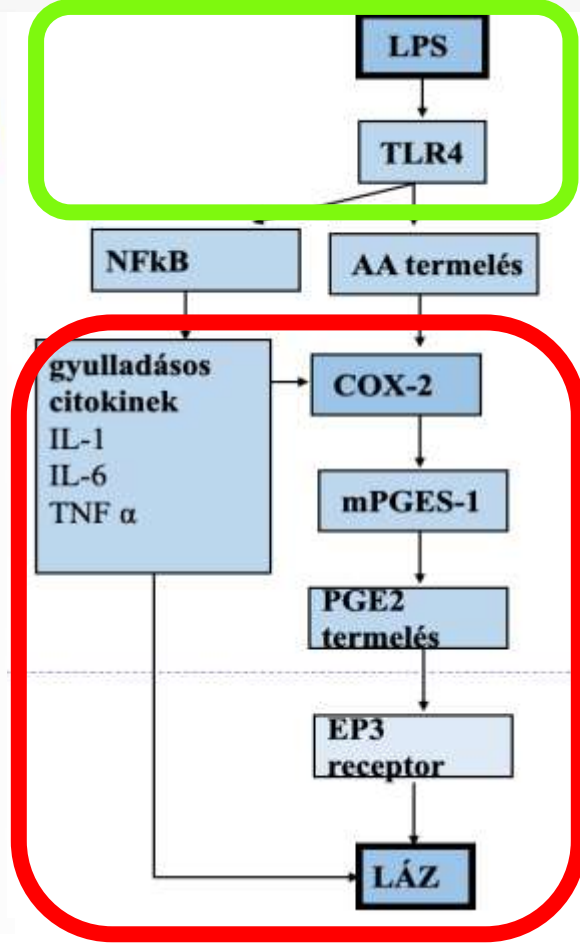
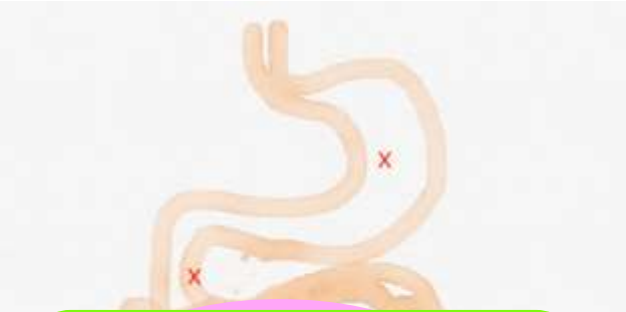
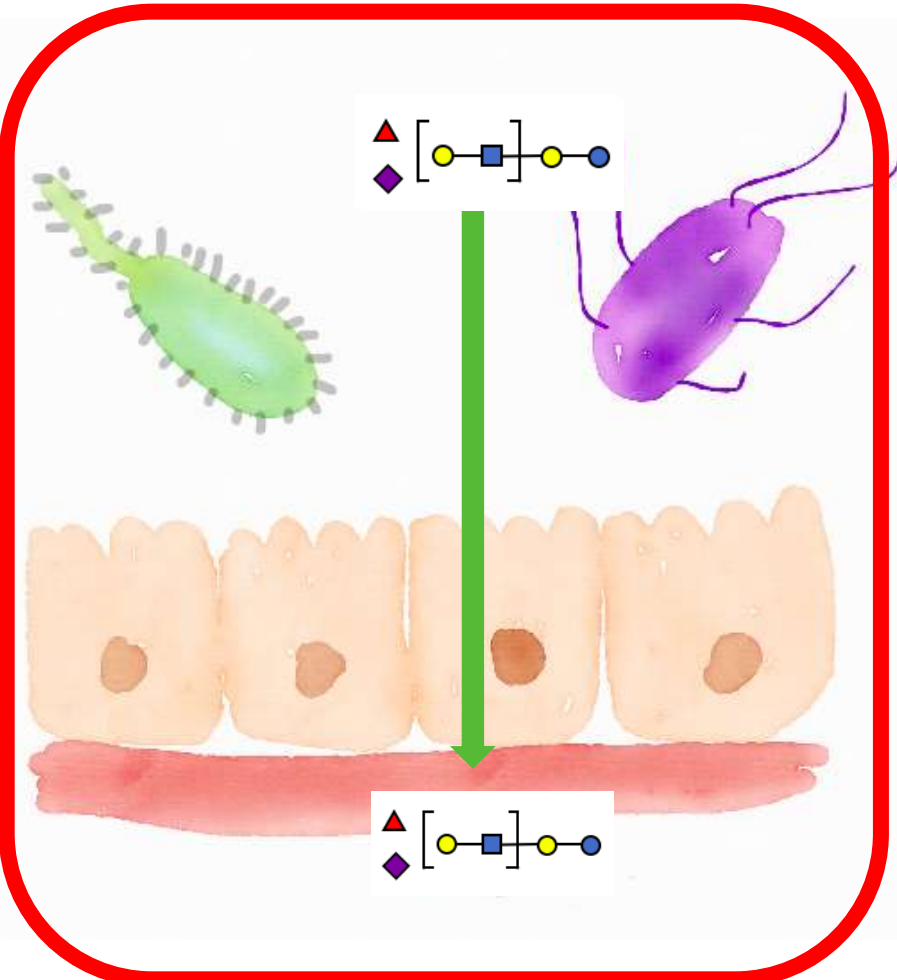
- LNT (14.5mg/kg)-LPS(120ug/kg), n=6
- ▲ LNT (14.5mg/kg)-fiz.só, n=6
- fiz.só- LPS(120ug/kg), n=12
- △ fiz.só-fiz.só, n=17

*p< 0.05
 ** p<0.01
 *** p<0.001
 2 utas ANOVA

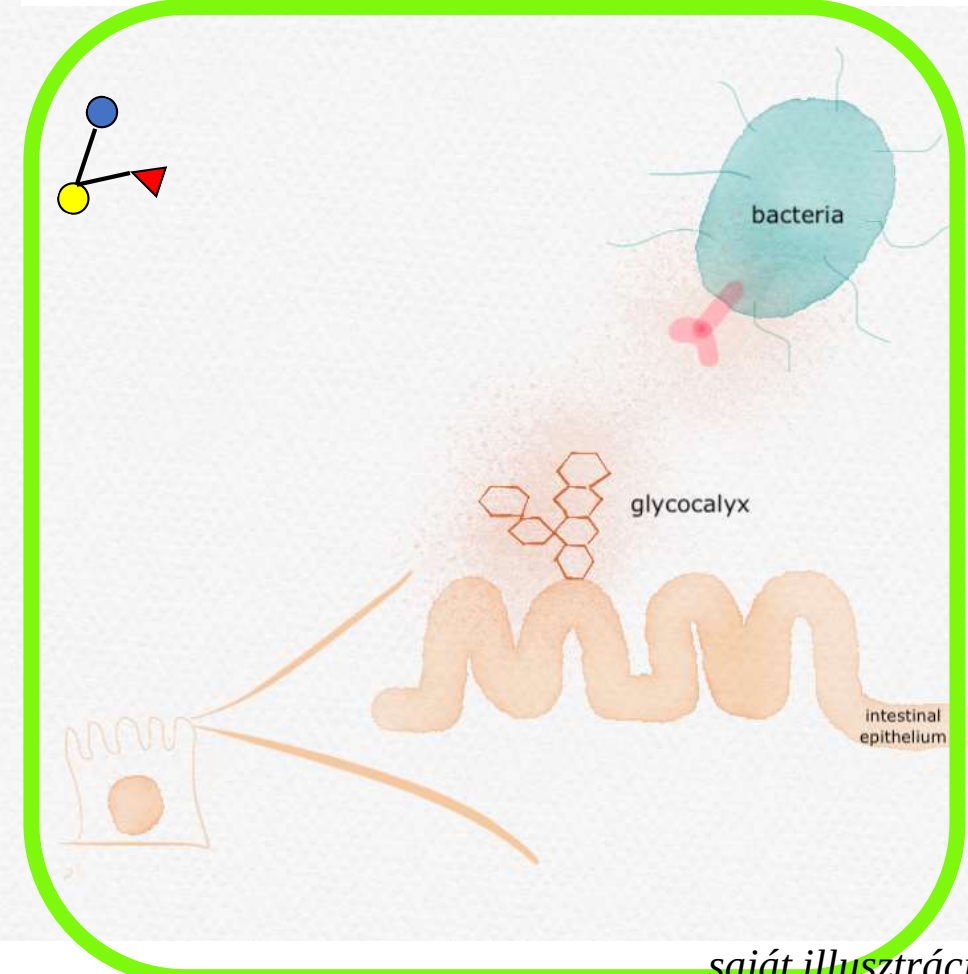
T=33°C

Célkitűzés - Lehetséges hatásmód

Szisztémás - prekondicionálás

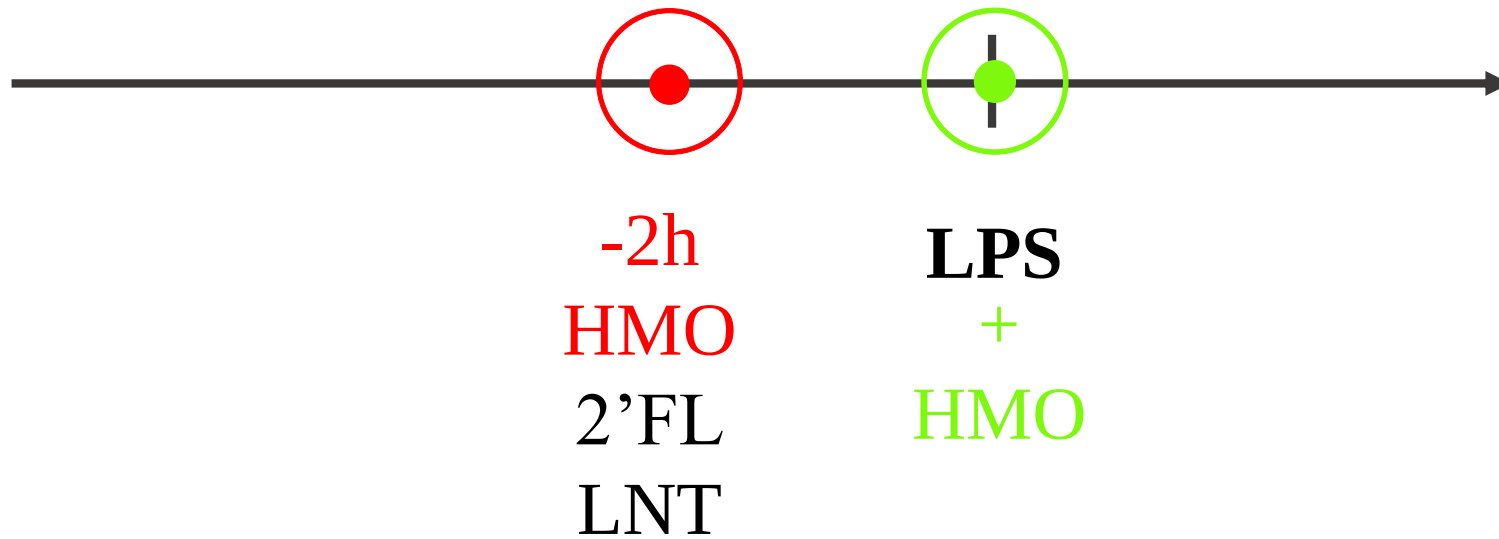


Lokális – fiziko-kémiai

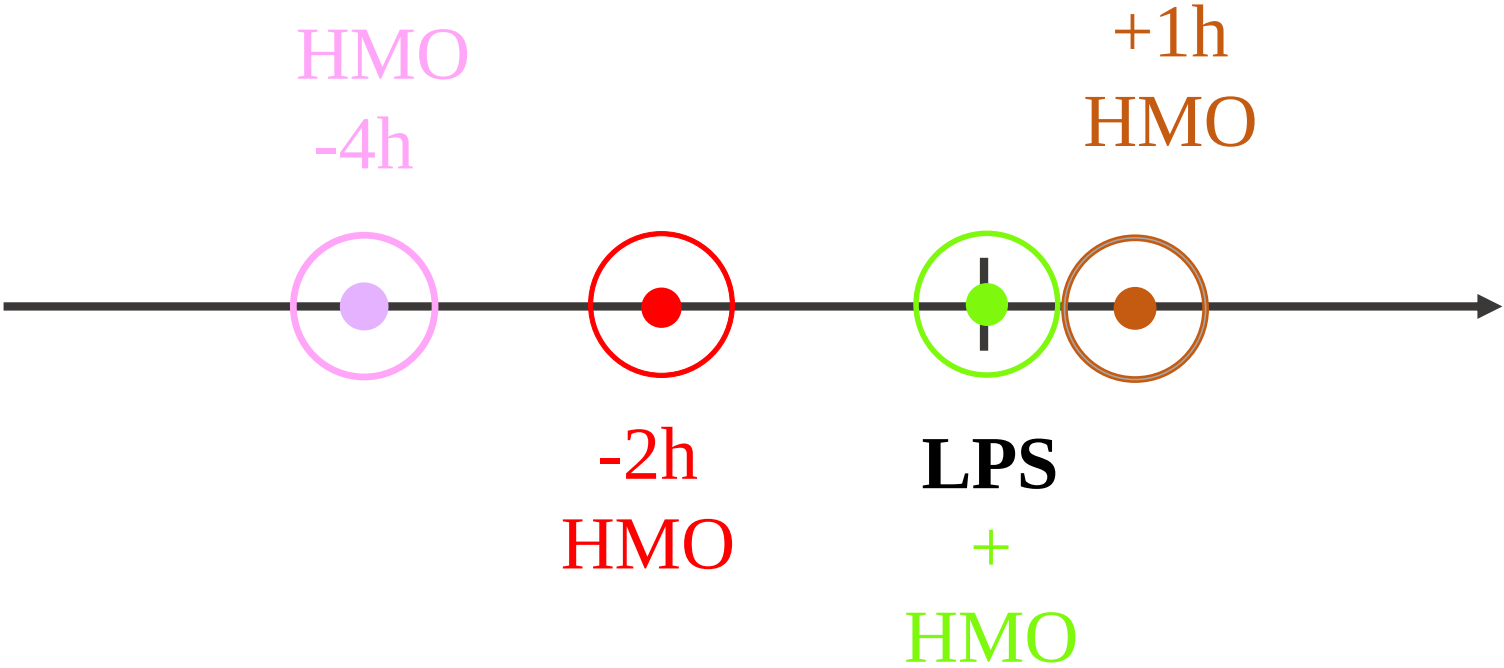


saját illusztráció

Célkitűzés - Lehetséges hatásmód



Célkitűzés

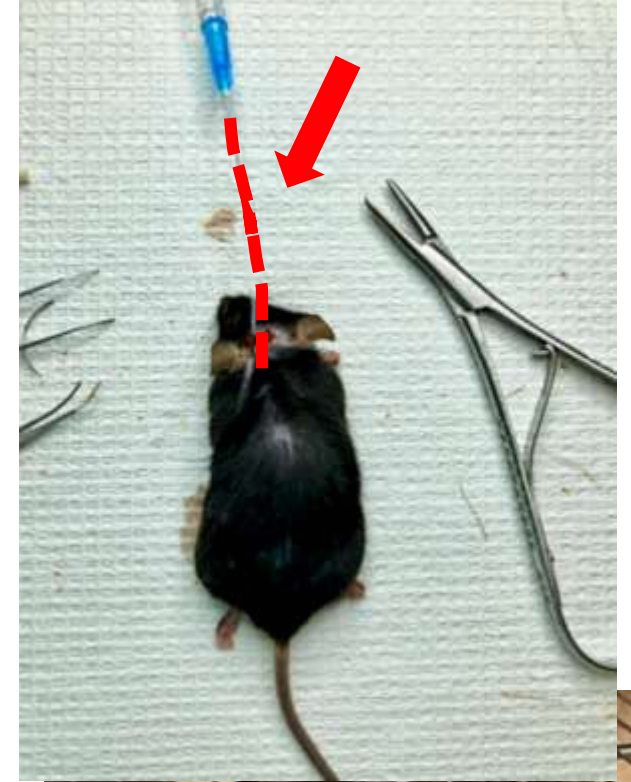


Módszerek 1. - in vivo

2 hét
szoktatás

Intraperitoneális
műtét

Kísérlet



Etikai engedélyszám: BA02/2000-6/2018

Módszerek 1. - in vivo

2 hét
szoktatás

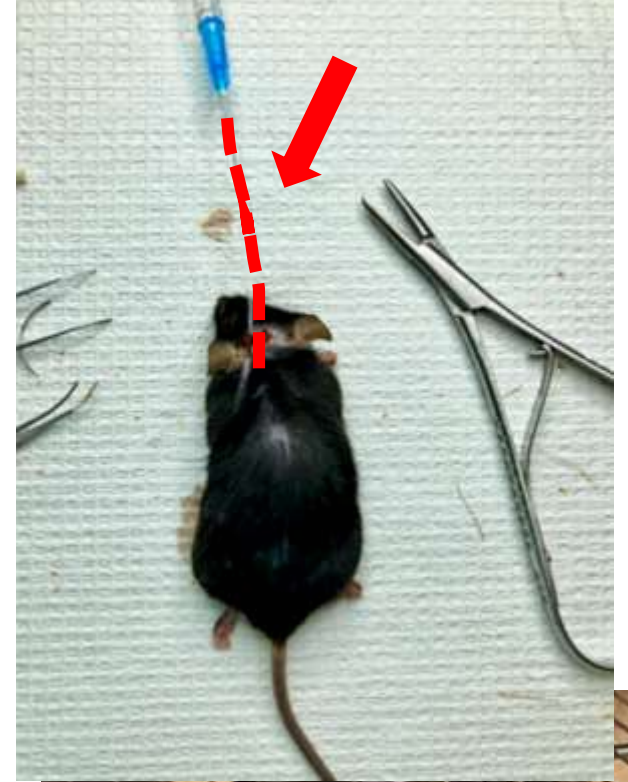
Intraperitoneális
műtét

Kísérlet

HMO

LPS ip.

Etikai engedélyszám: BA02/2000-6/2018



Módszerek 1. - in vivo

2 hét
szoktatás

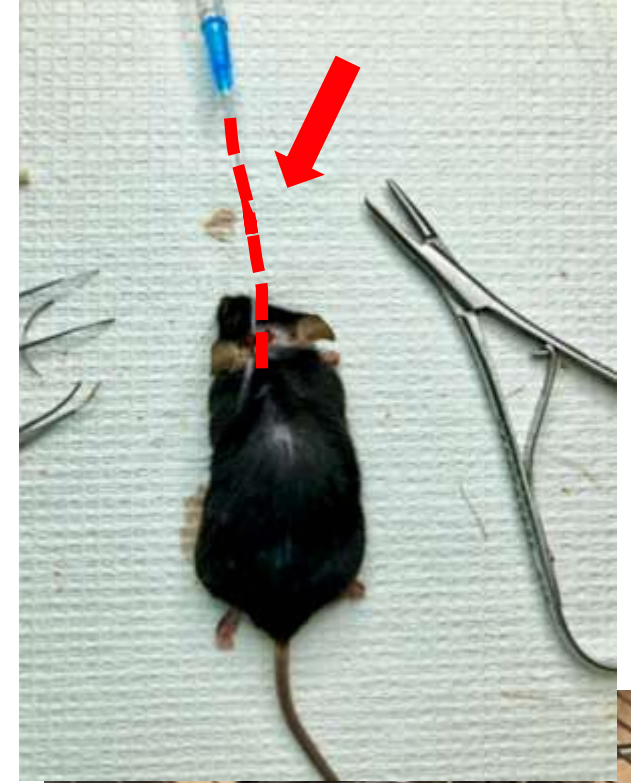
Intraperitoneális
műtét

Kísérlet

HMO ip.

-4 h

LPS ip.



Módszerek 1. - in vivo

2 hét
szoktatás

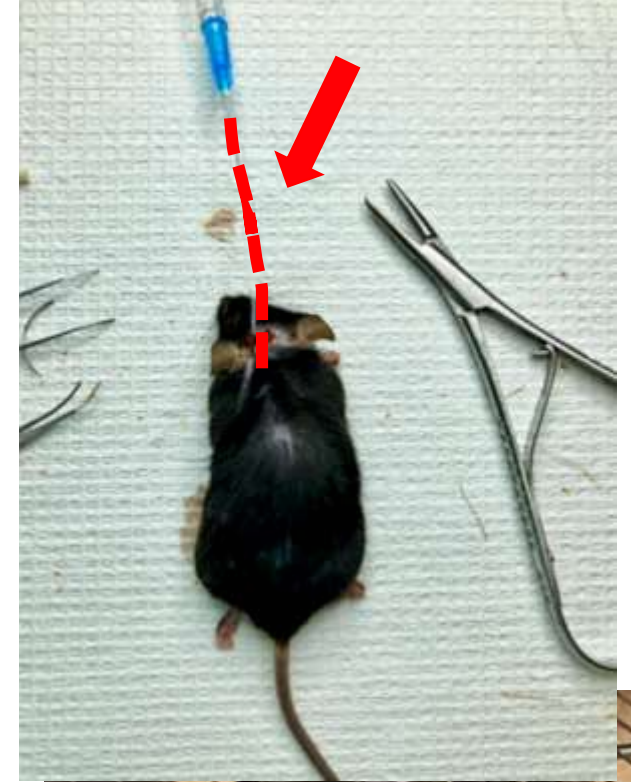
Intraperitoneális
műtét

Kísérlet

LPS ip.

+1 h

HMO ip.





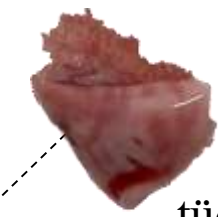
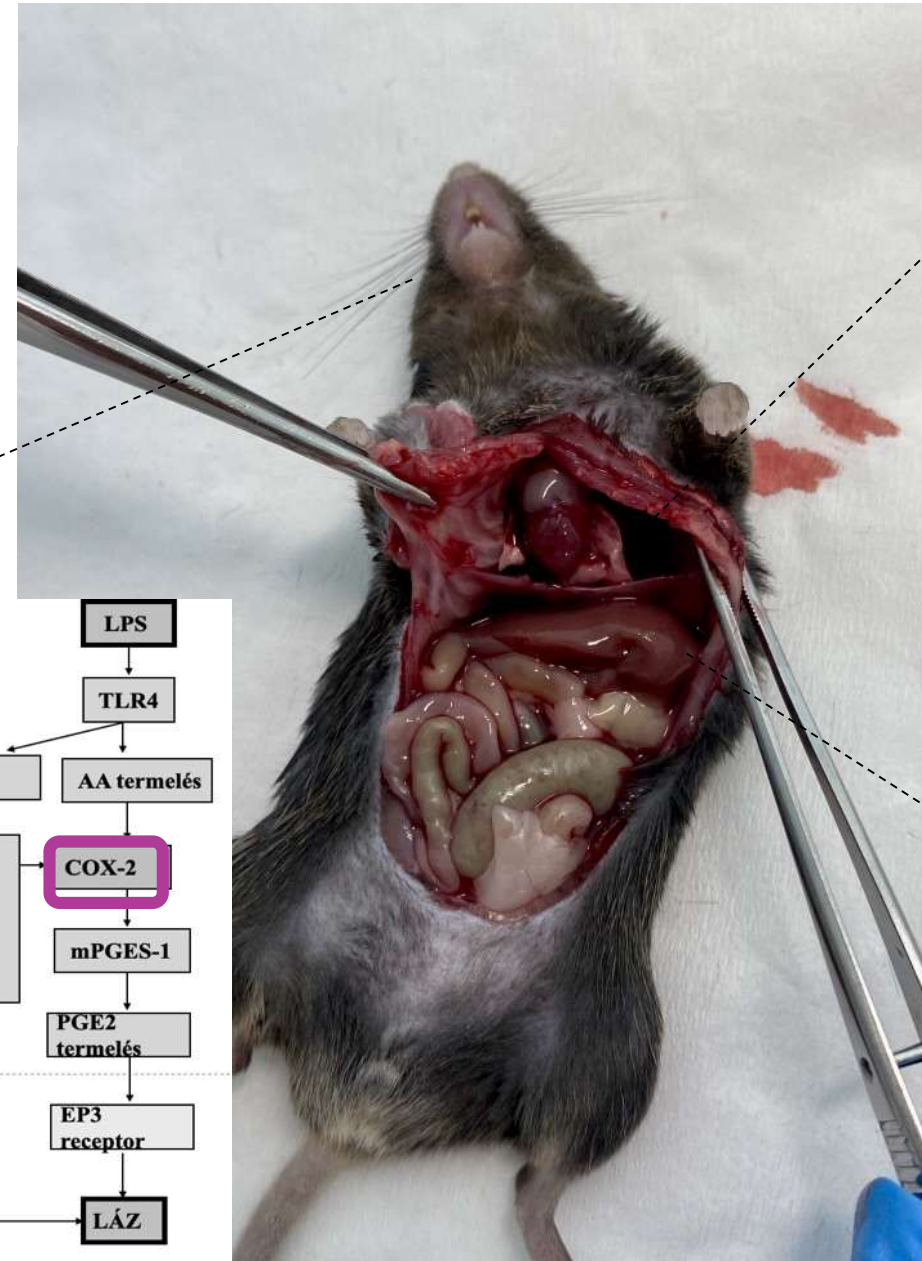
-2h
2'FL

LPS

2. - in vitro-PCR



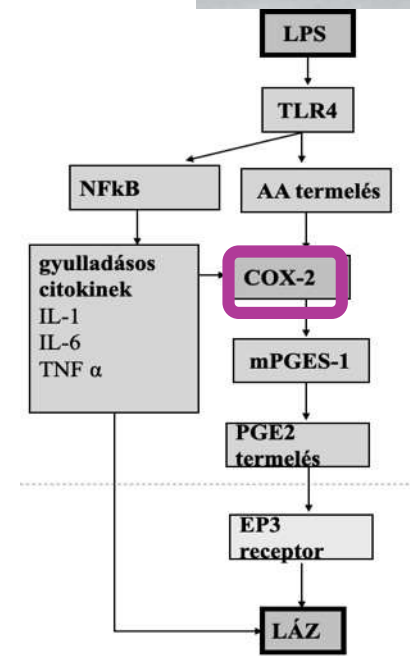
agy



tüdő



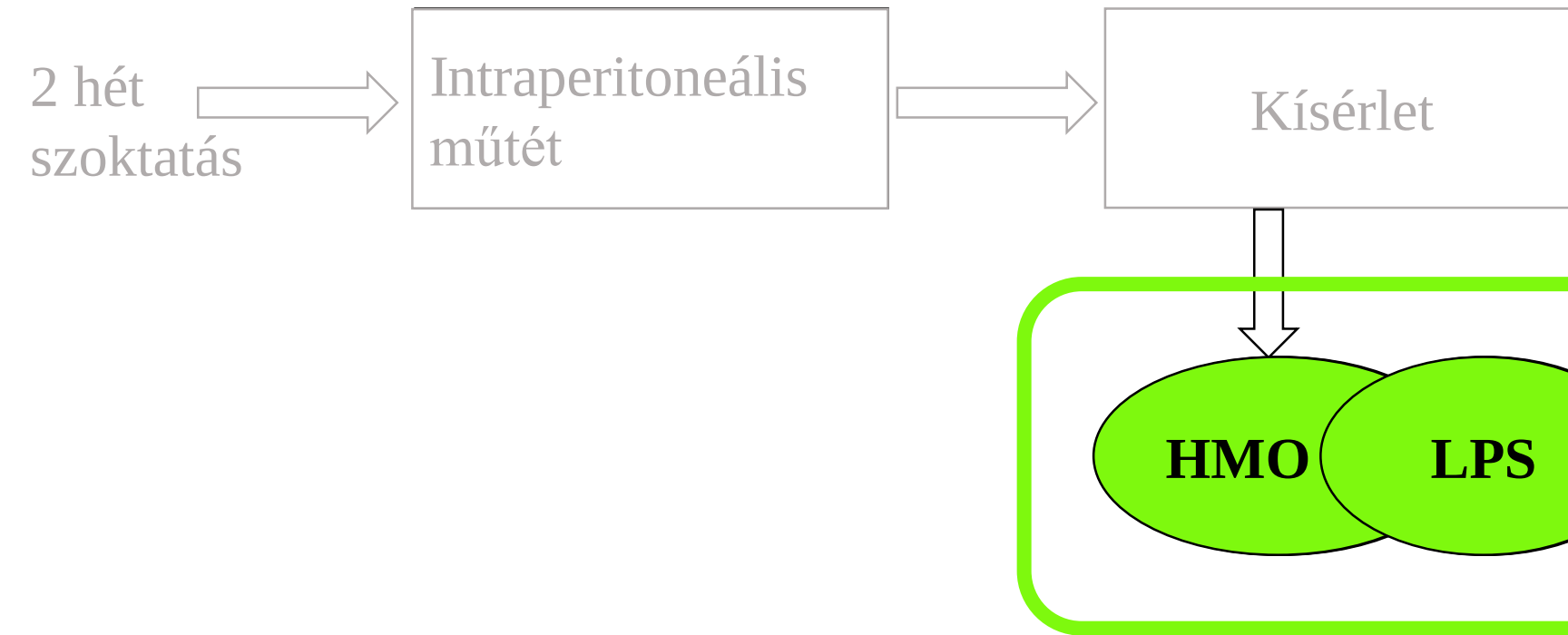
máj



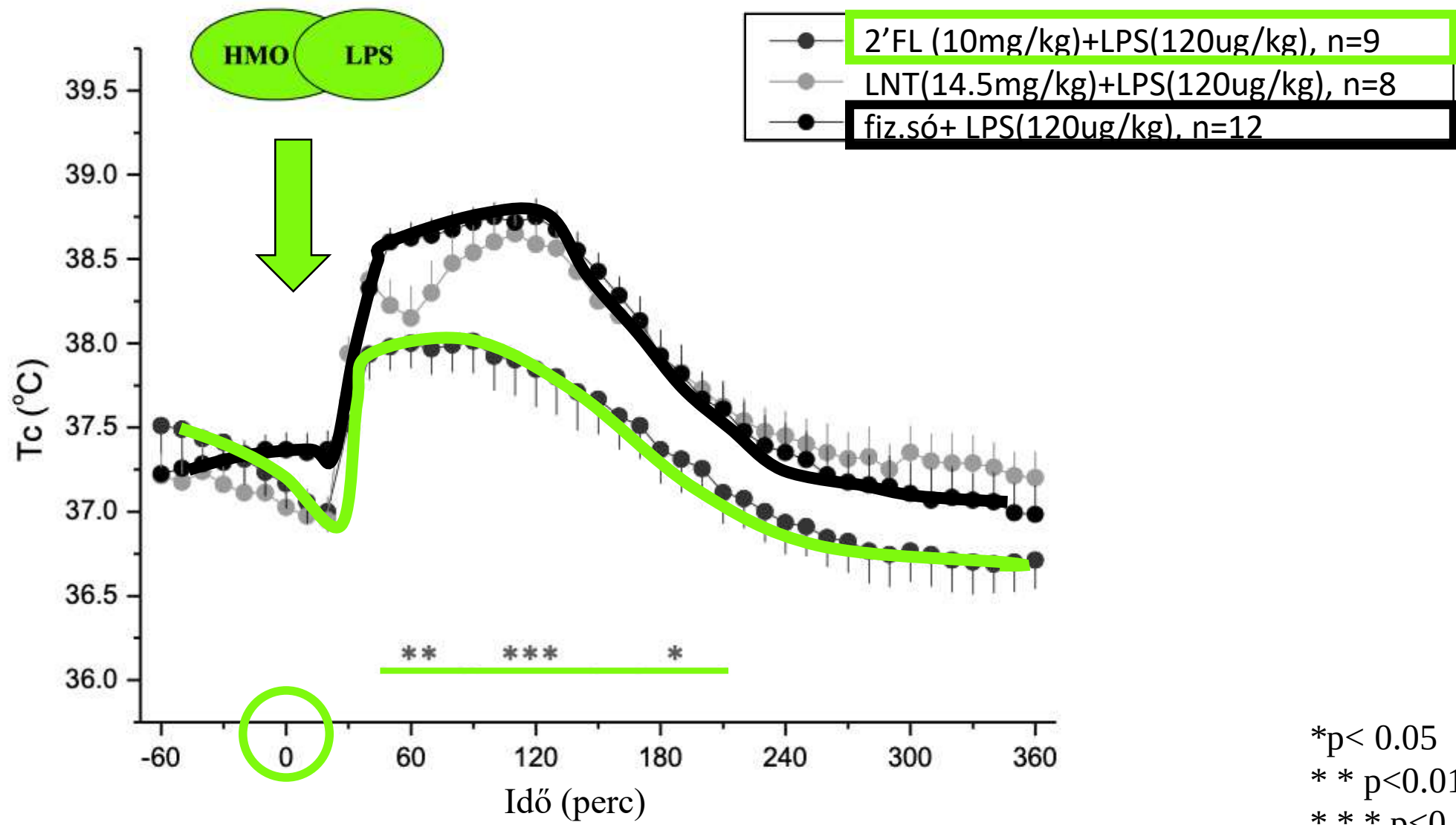


Eredmények

Lokális hatás modellálása

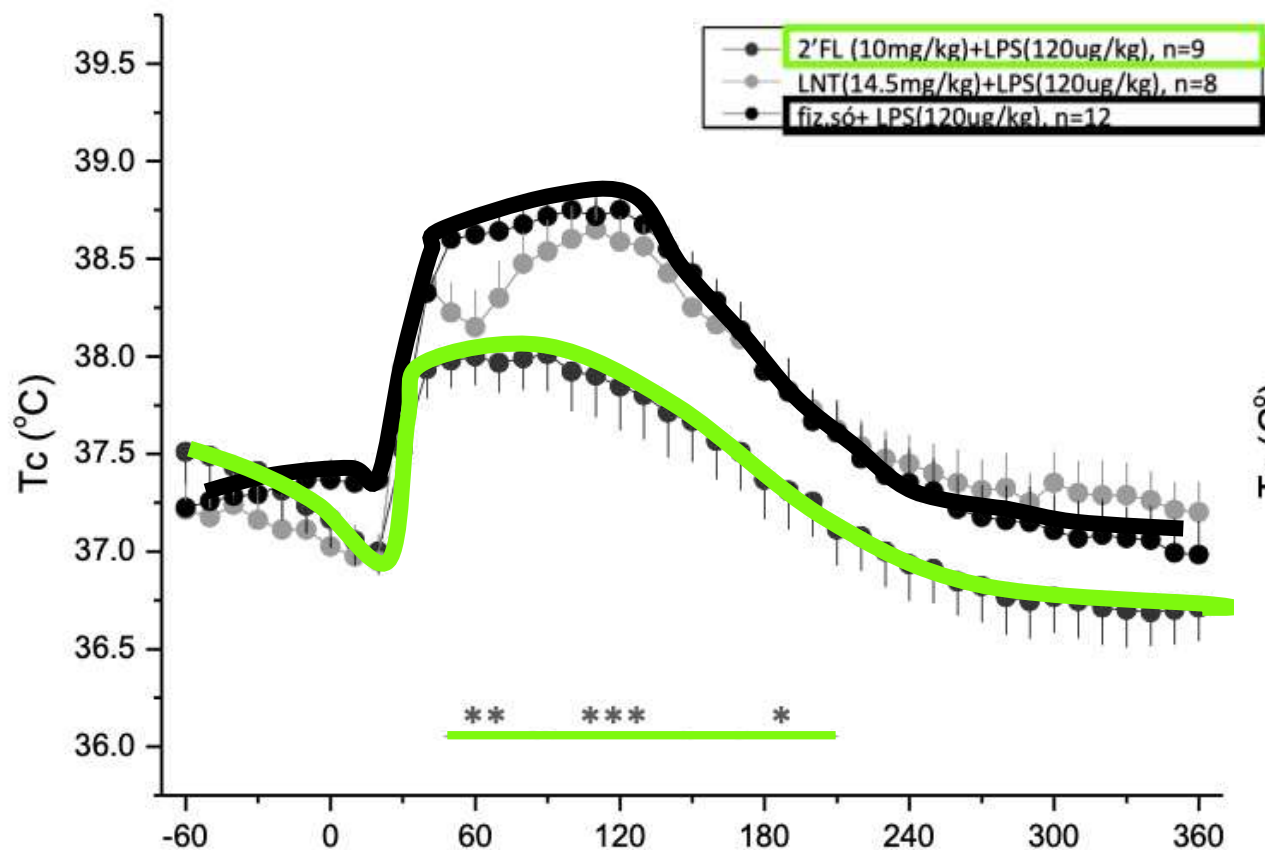
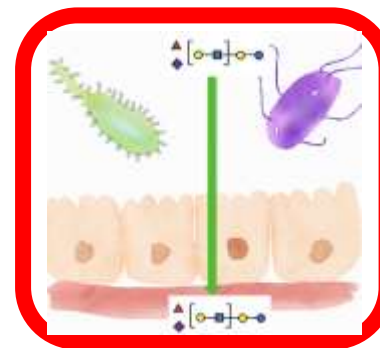


HMO-LPS keverék eredménye



*p< 0.05
* * p<0.01
* * * p<0.001

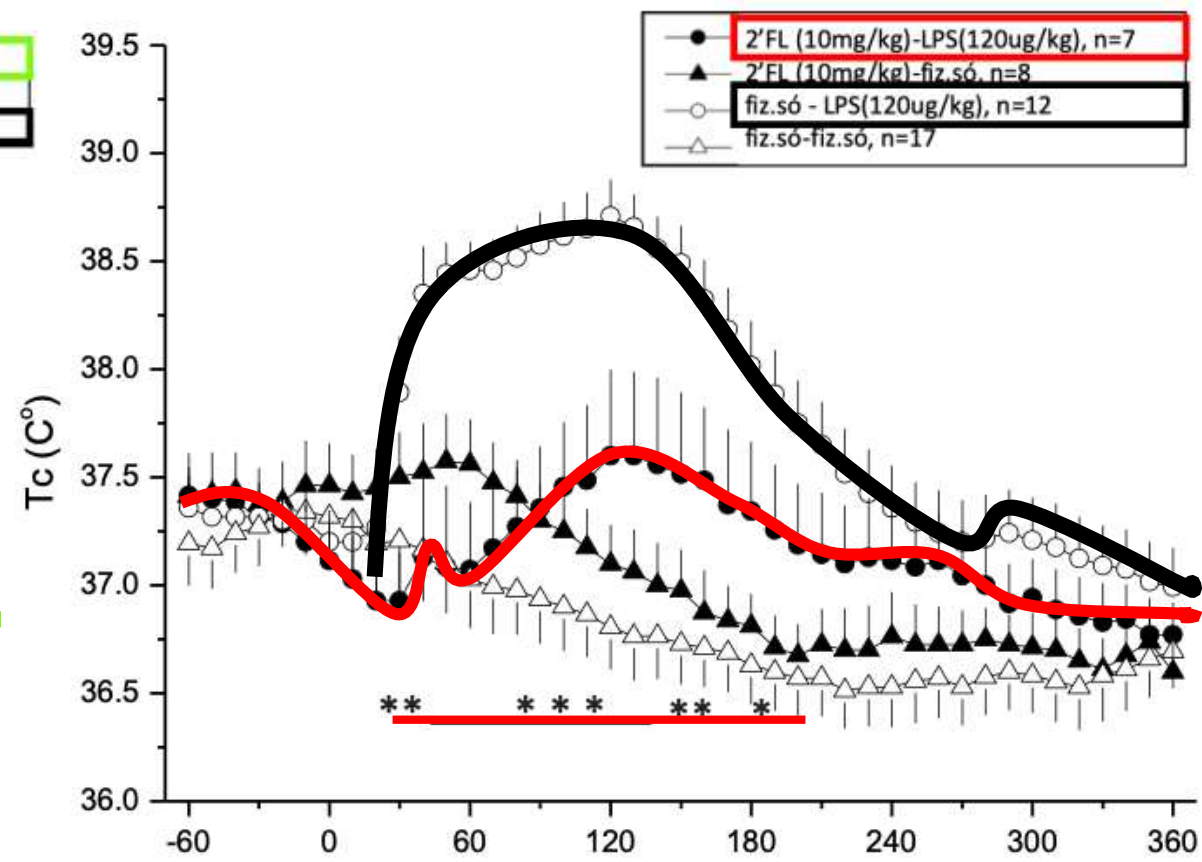
T=33°C



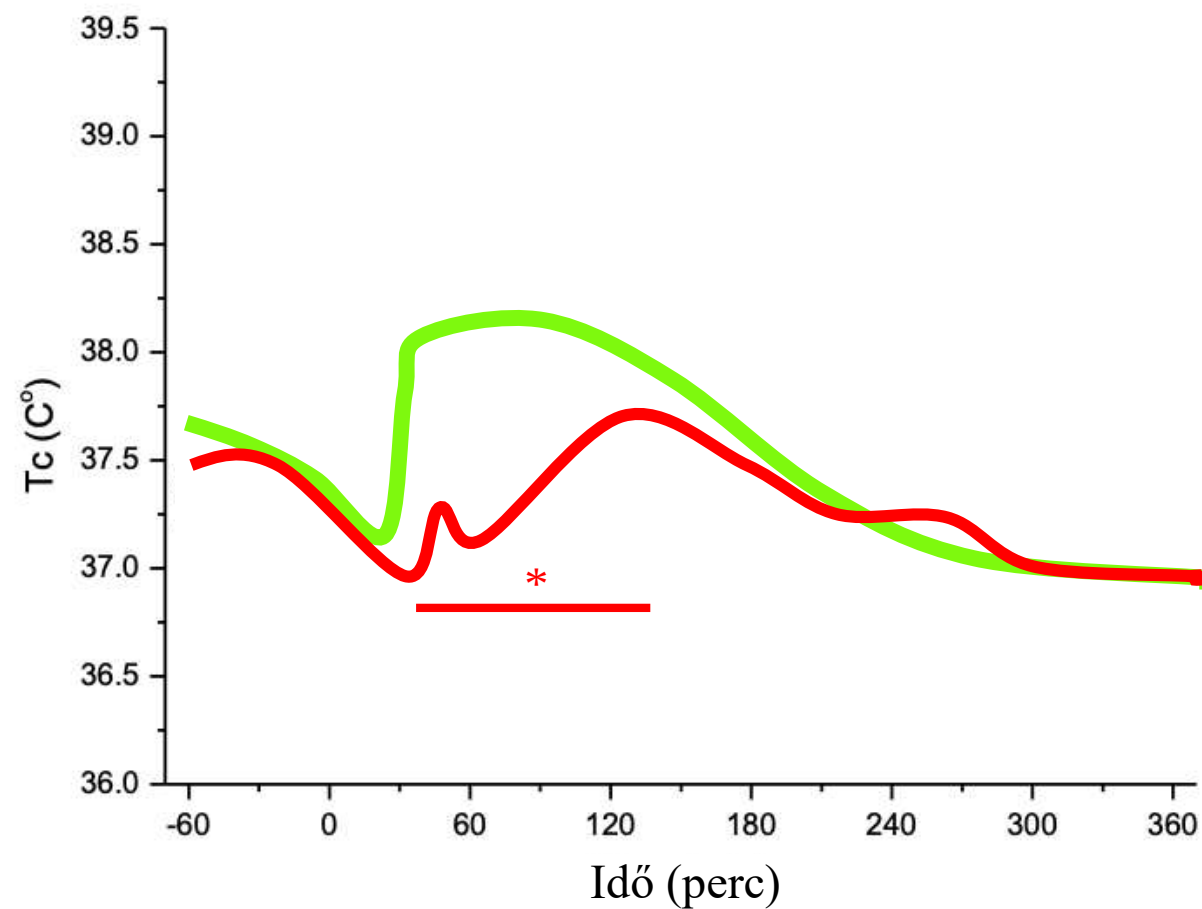
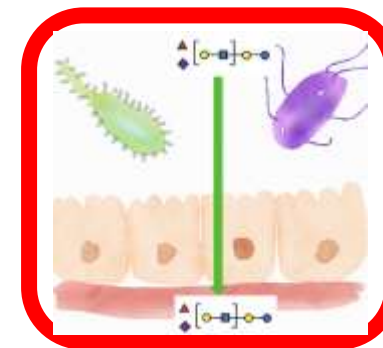
Idő (perc)

*p < 0.05 ** p < 0.01 *** p < 0.001

2 utas ANOVA

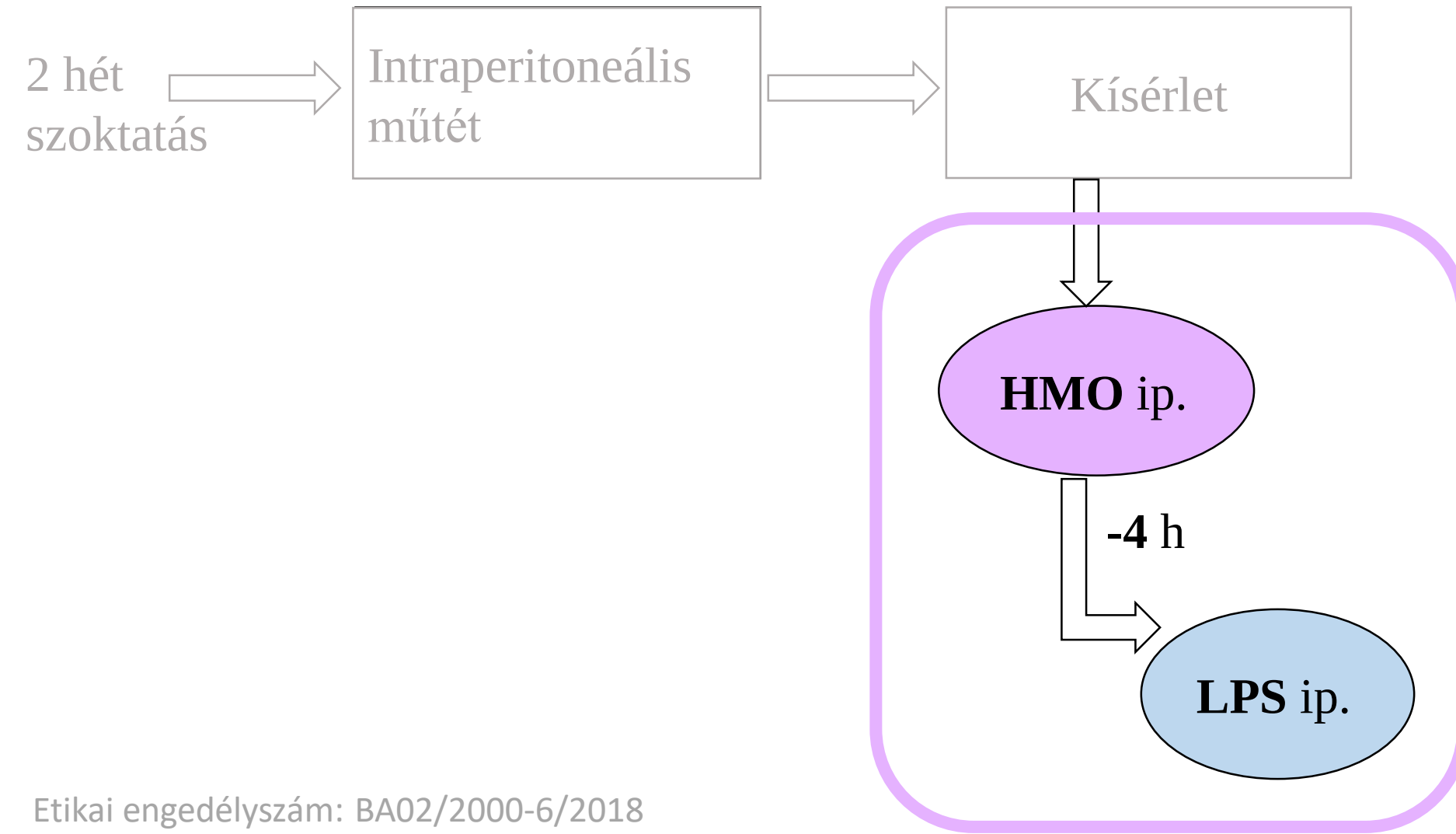


Idő (perc)

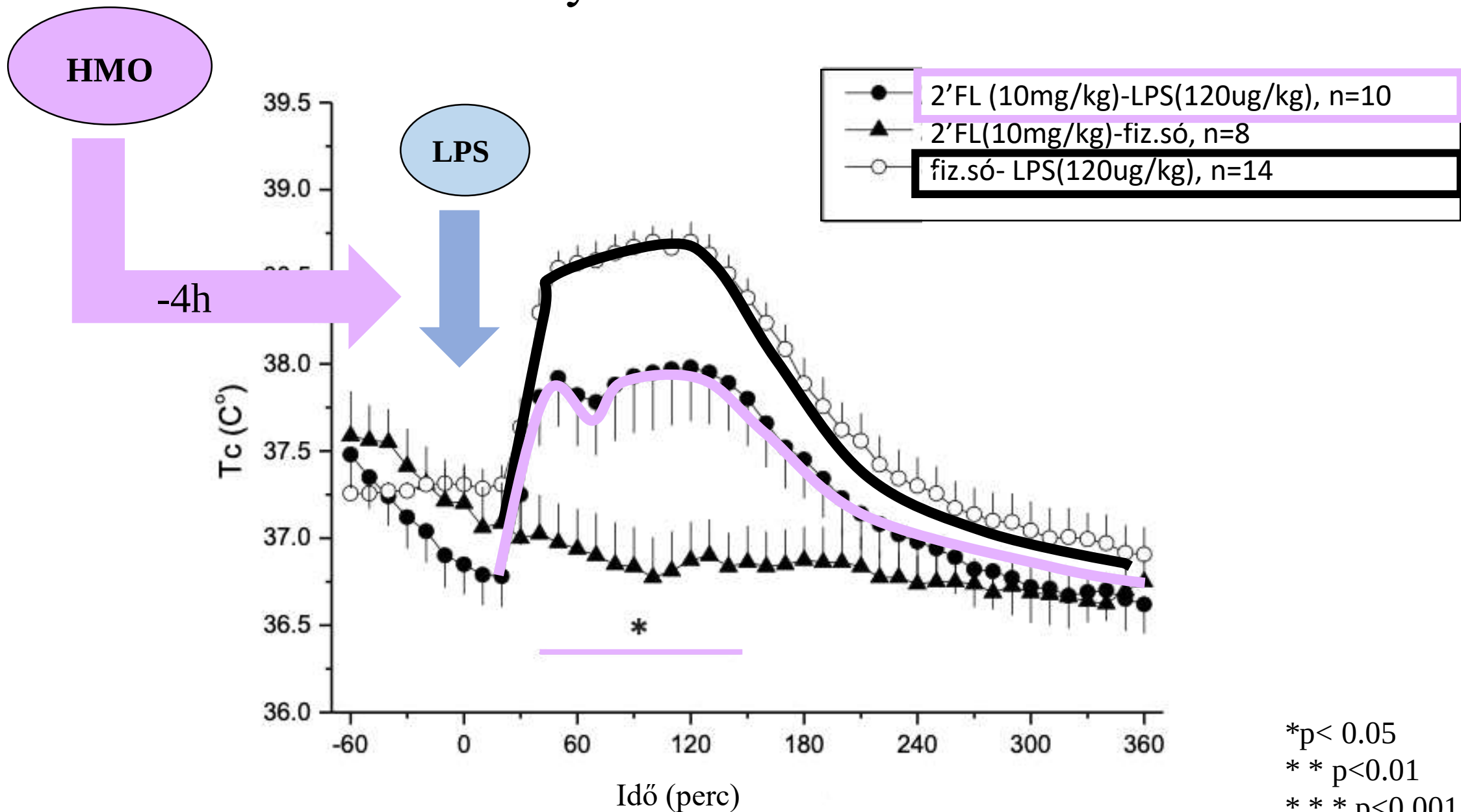


*p< 0.05
2 utas ANOVA

Az anyatej védőhatásának modellálása

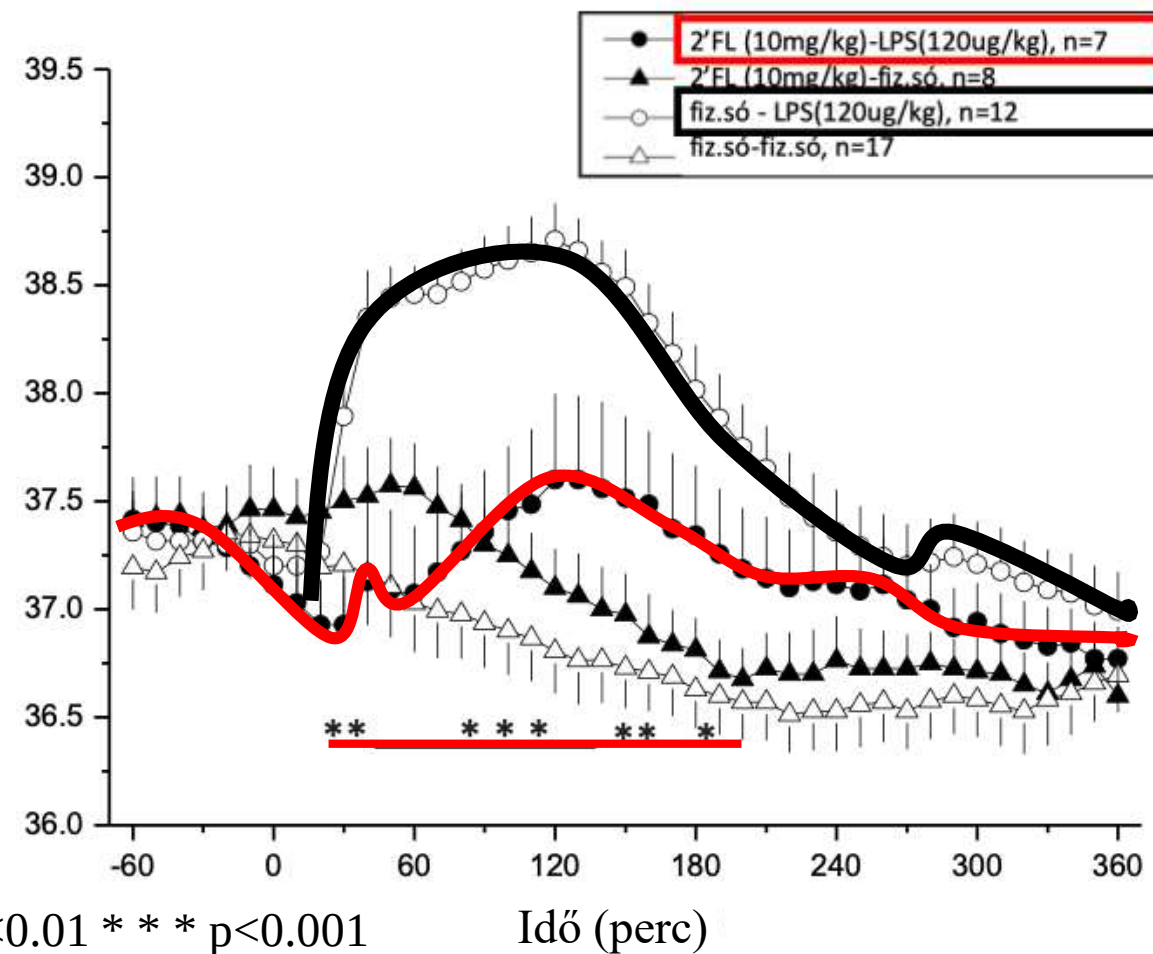
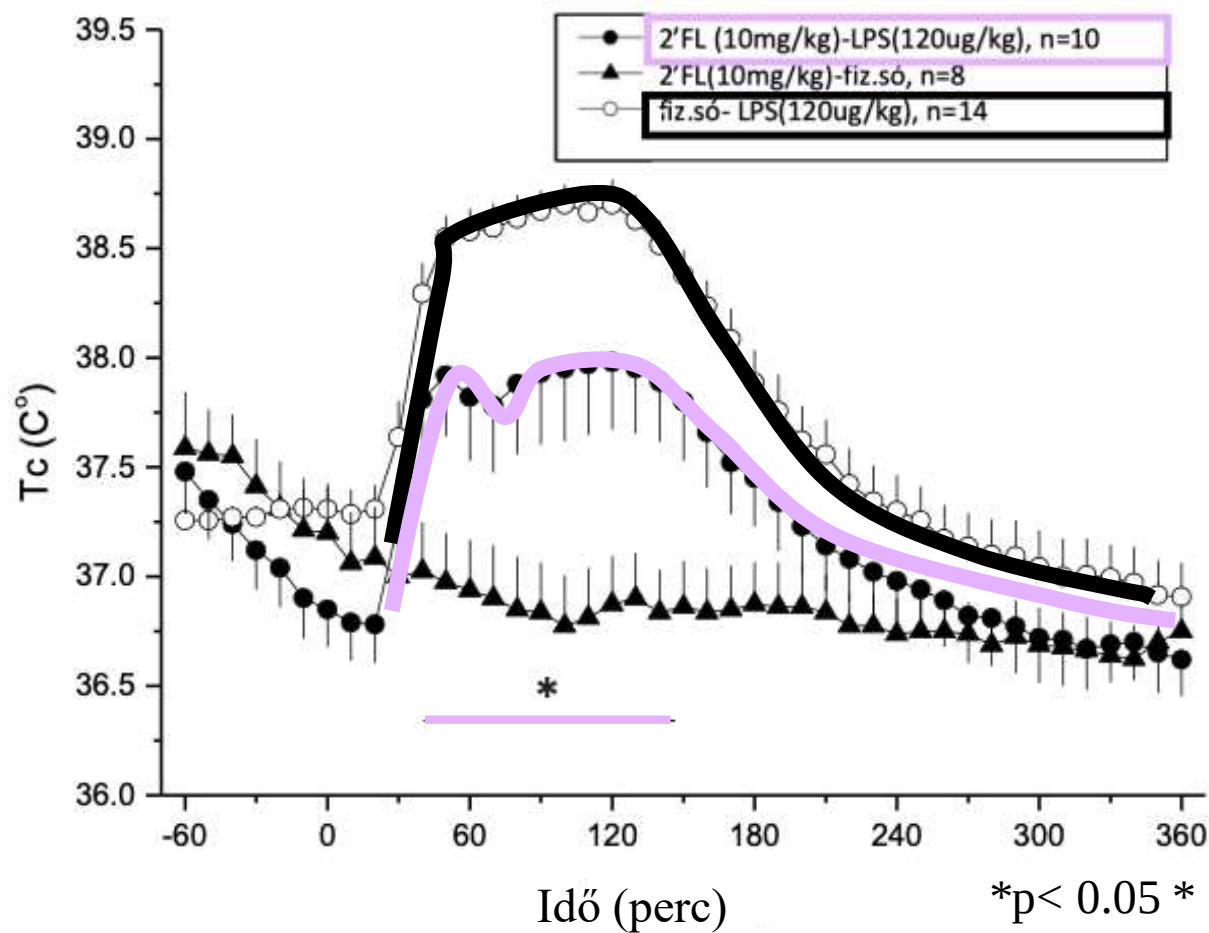
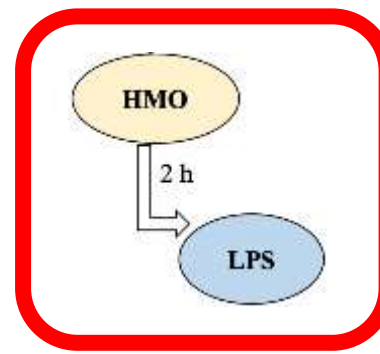
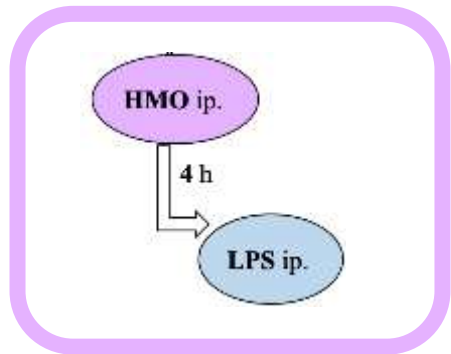


4h-s 2'FL előkezelés eredménye



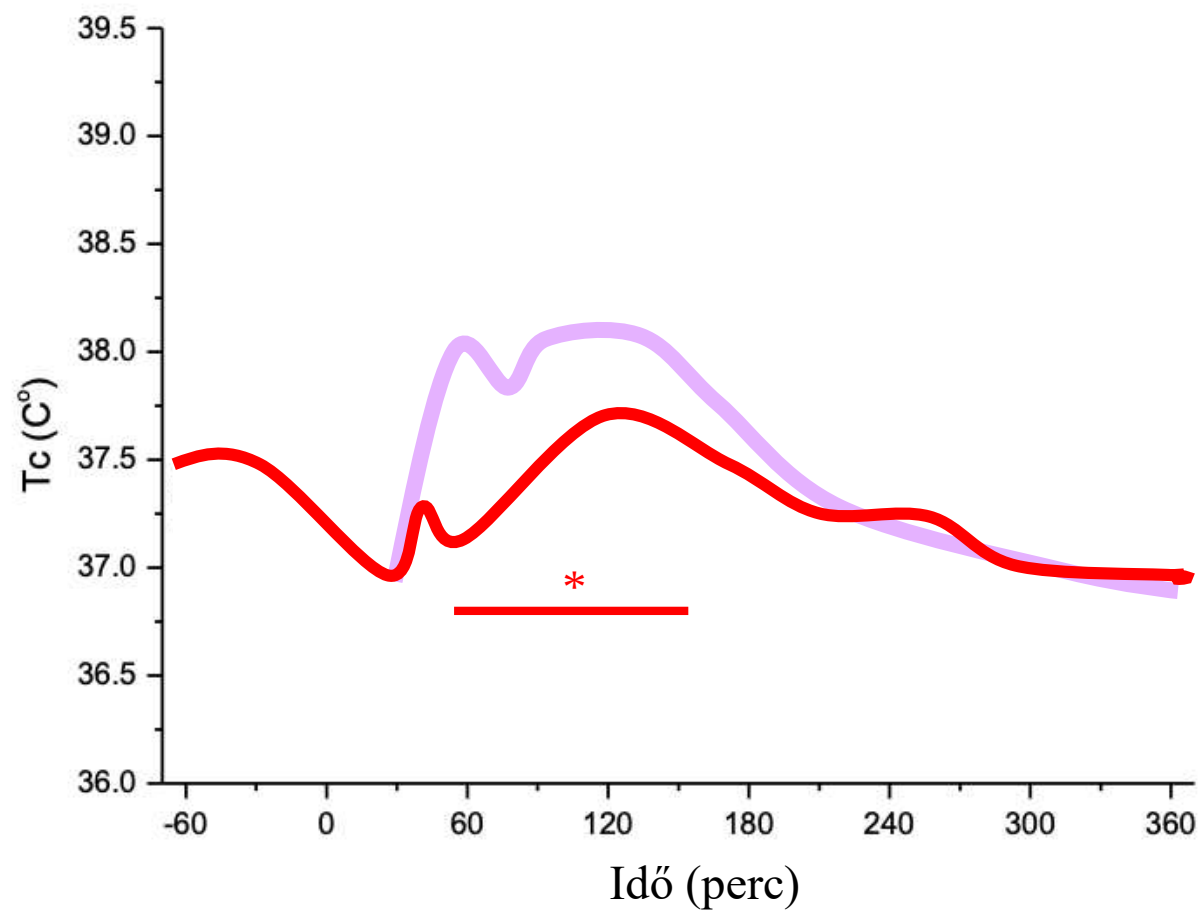
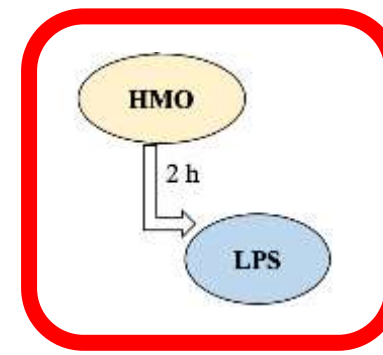
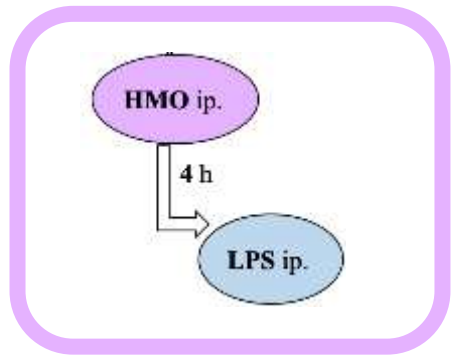
*p< 0.05
** p<0.01
*** p<0.001
2 utas ANOVA

T=33°C



*p < 0.05 ** p < 0.01 *** p < 0.001

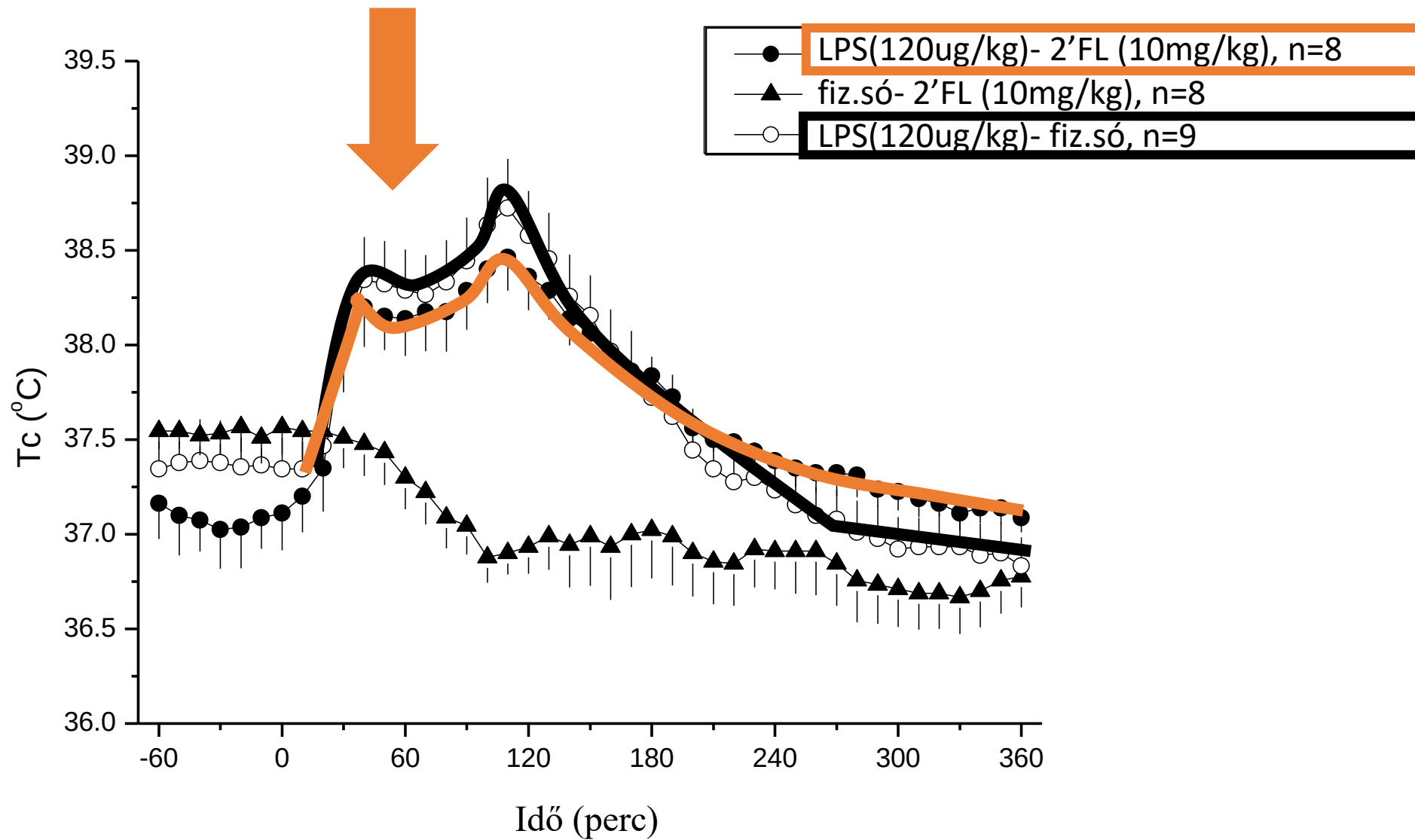
2 utas ANOVA



* $p < 0.05$
2 utas ANOVA

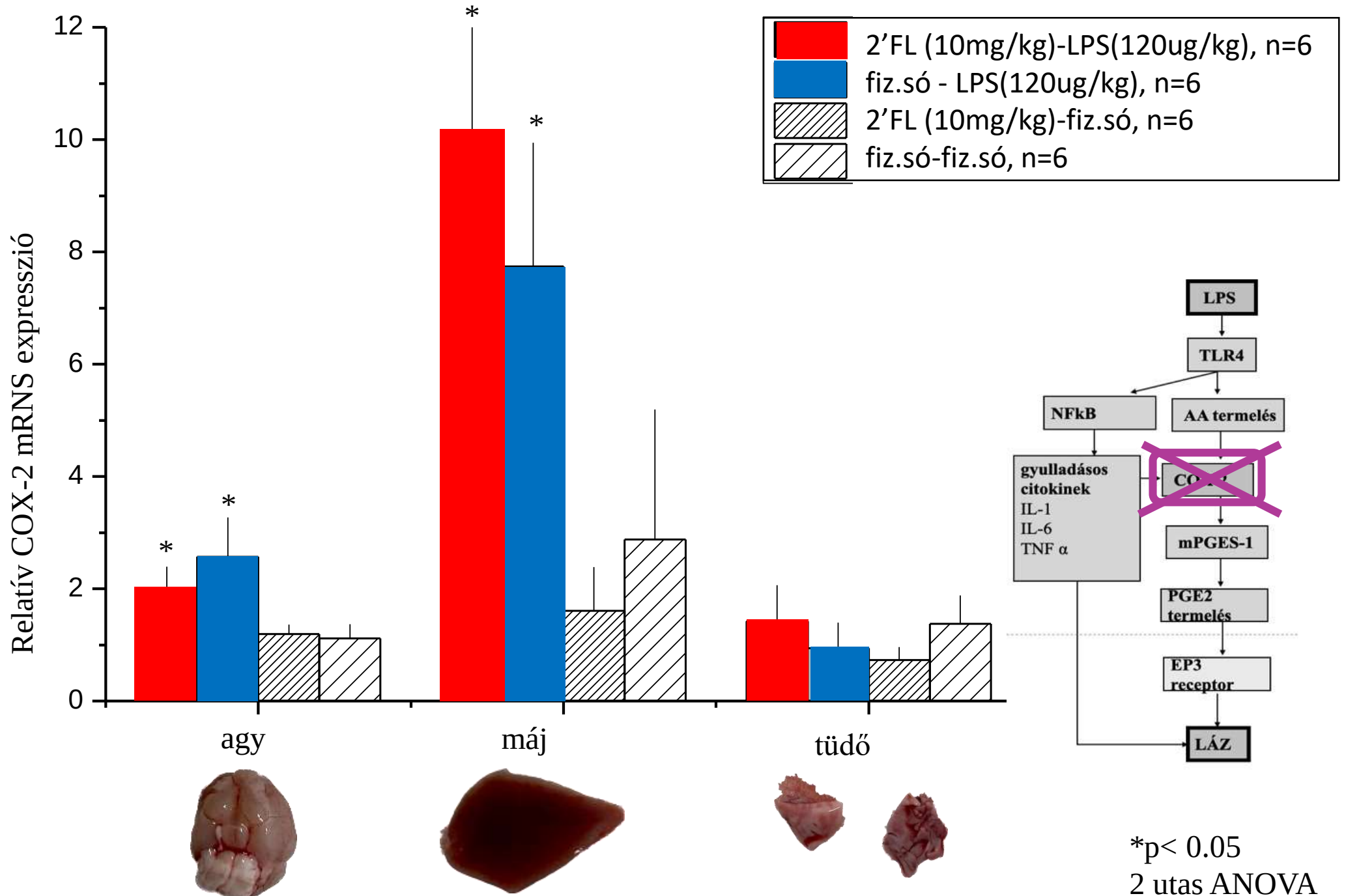
60 perccel később 2'FL adása

HMO



T=33°C

Eddigi in vitro eredmények



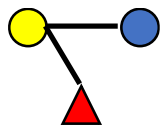


Következtetések

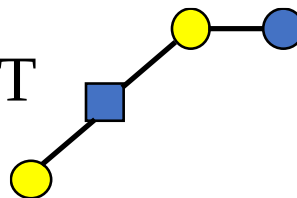
I.

Lázcsökkentő hatás

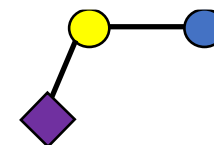
2'FL



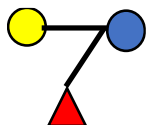
LNT



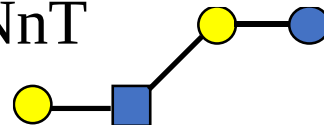
3'SL



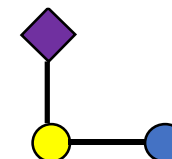
3'FL



LNnT

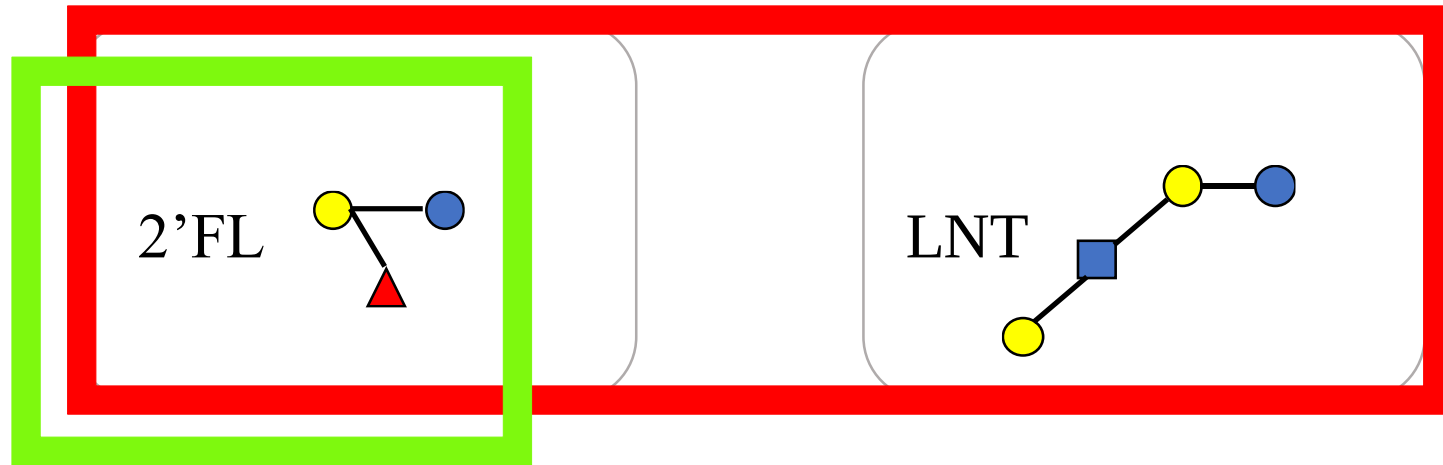


6'SL



II.

Szisztémás hatás



Lokális hatás

III.

WHO ajánlás
1. óra
1. 6 hónap
igény szerint

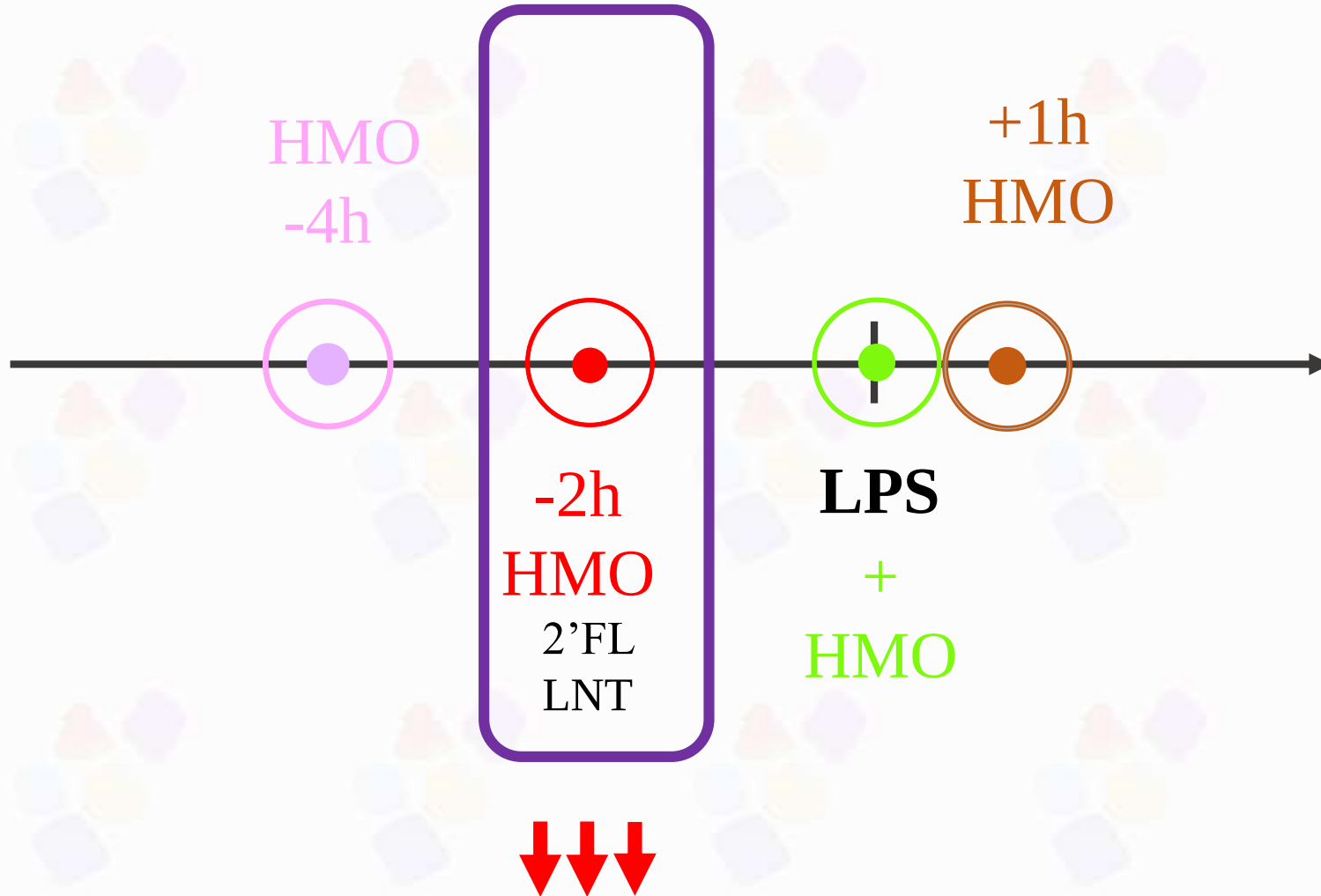


Mary Cassatt, Young Mother Nursing Her Child, 1906,
olajfestmény

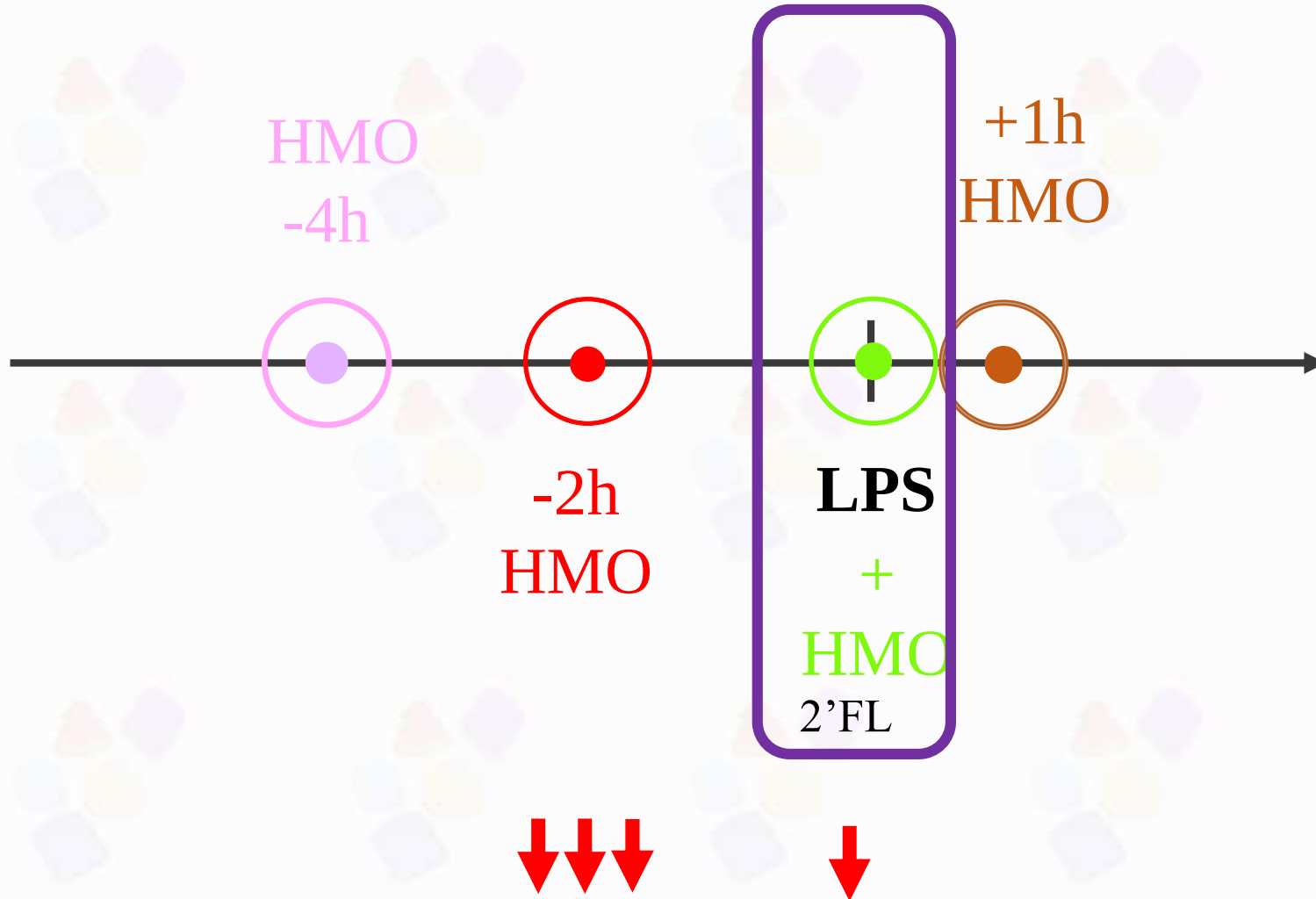
18% ↓	szepszis gyanú
36% ↓	szepszissel összefüggő
25% ↓	halálozás
	összes halálozás

(The Lancet, 2023)

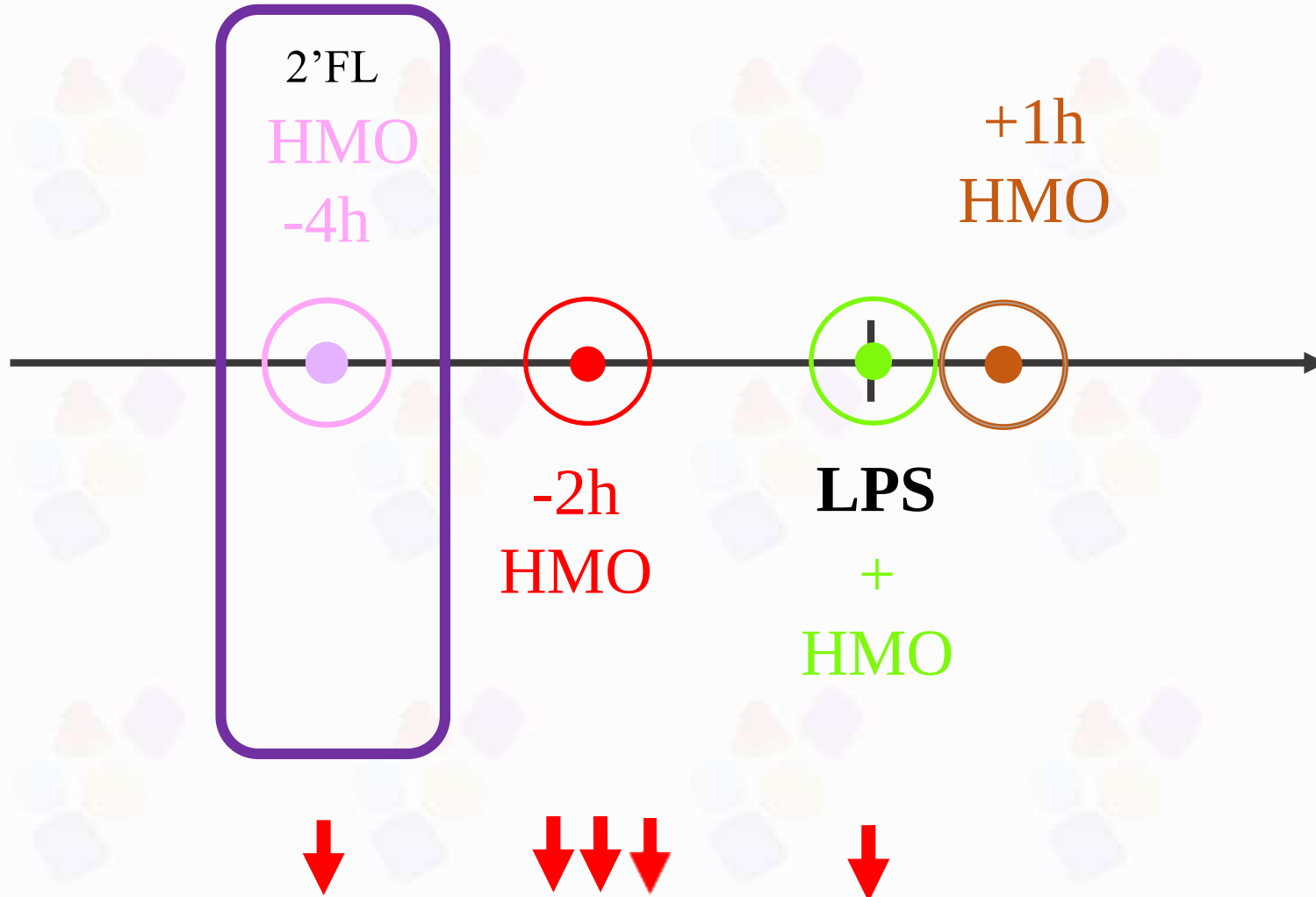
Összefoglalás - útravaló tudnivaló



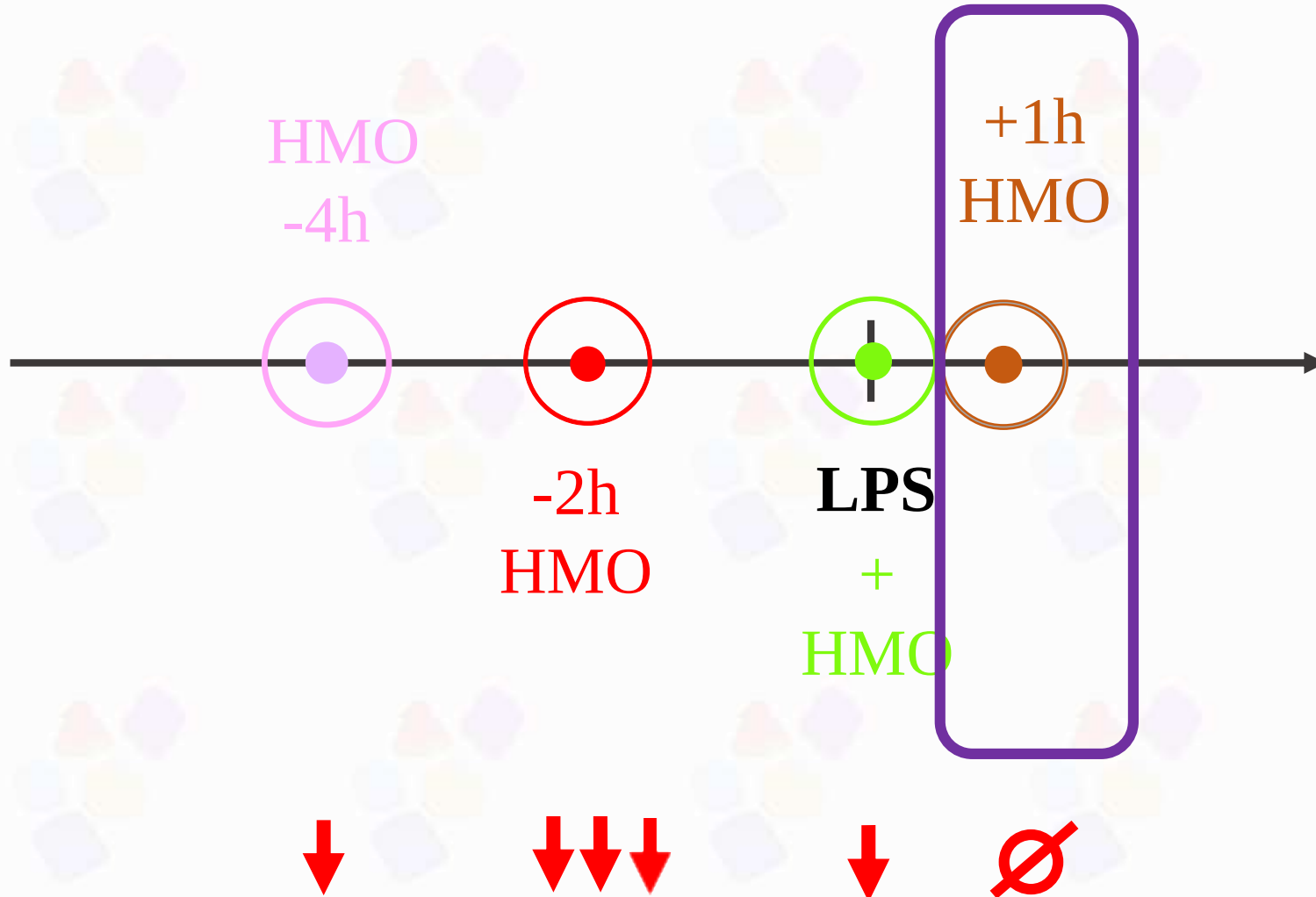
Összefoglalás



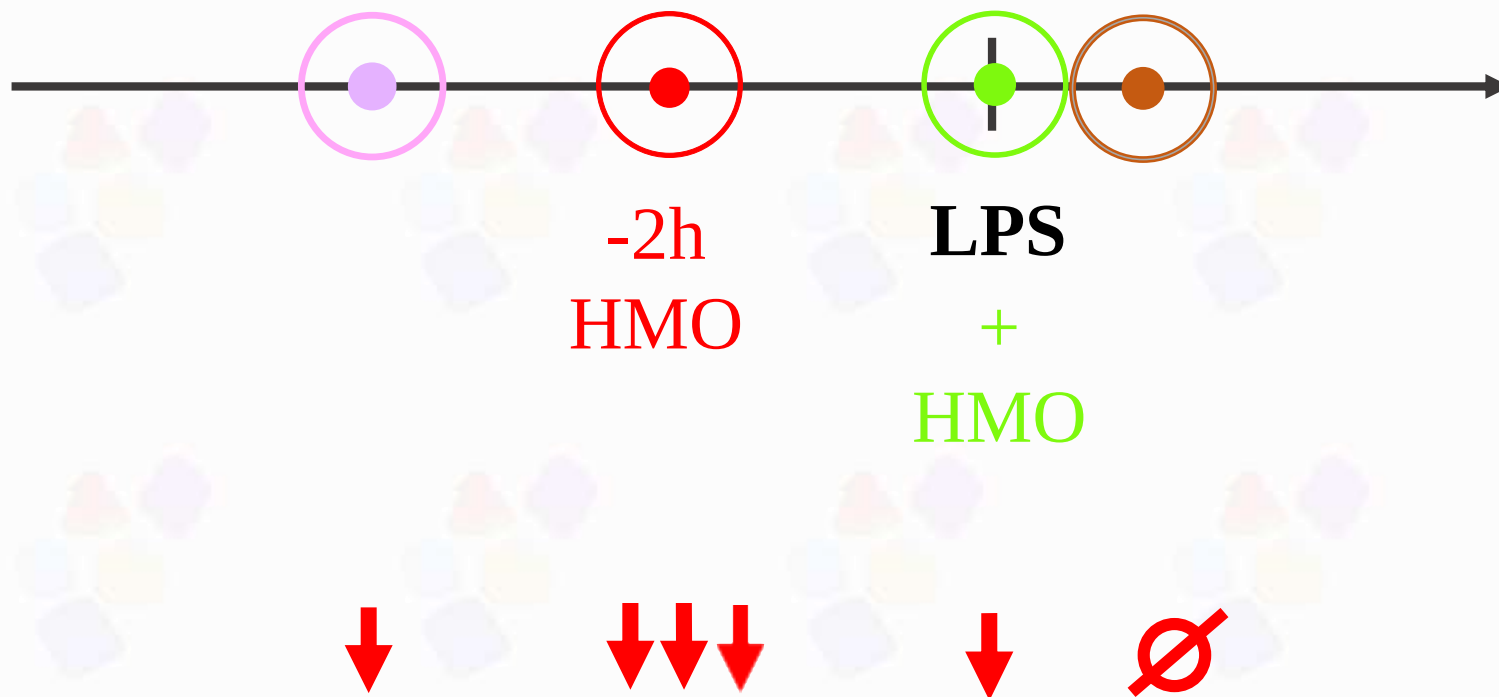
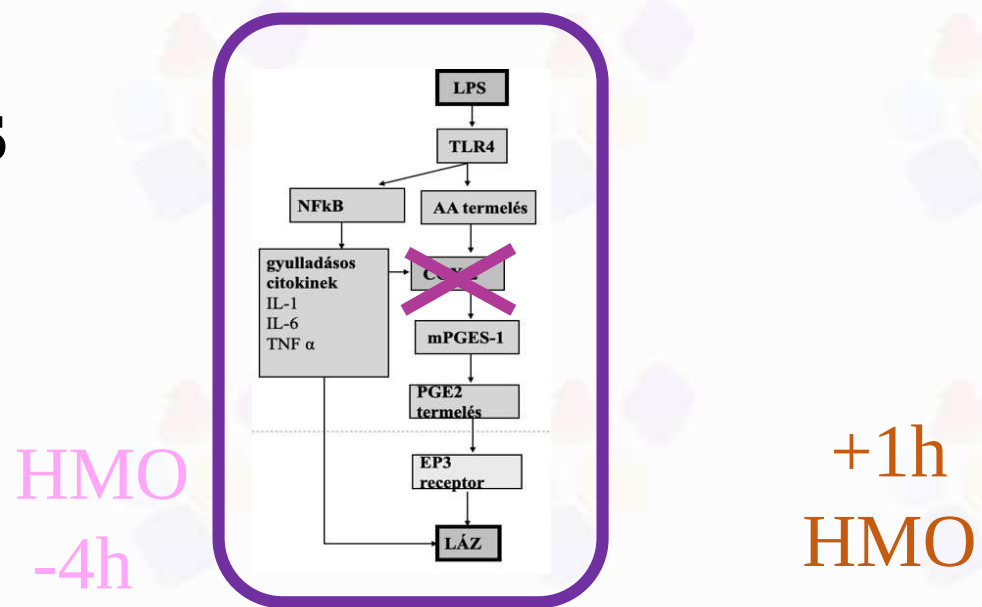
Összefoglalás



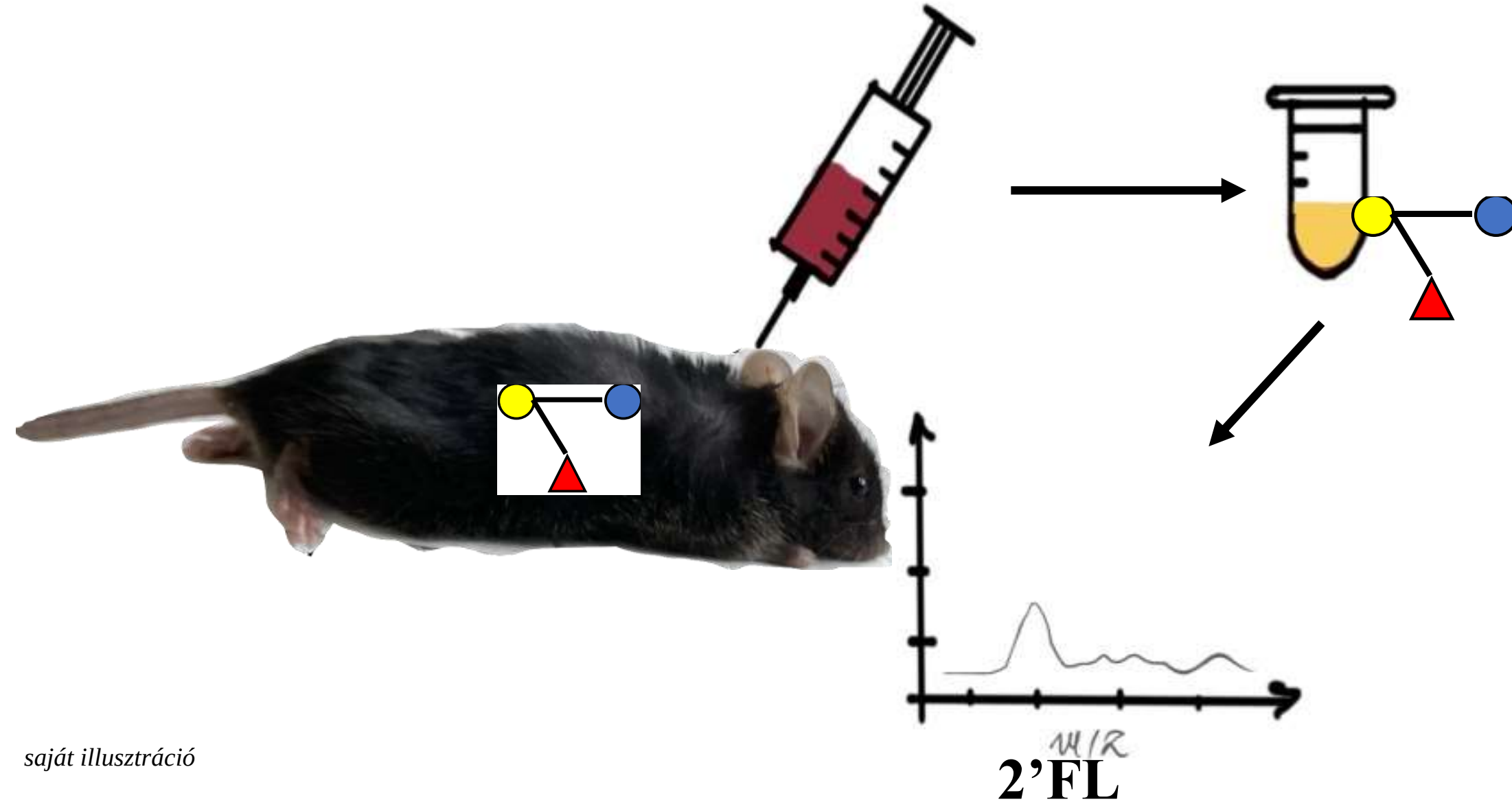
Összefoglalás



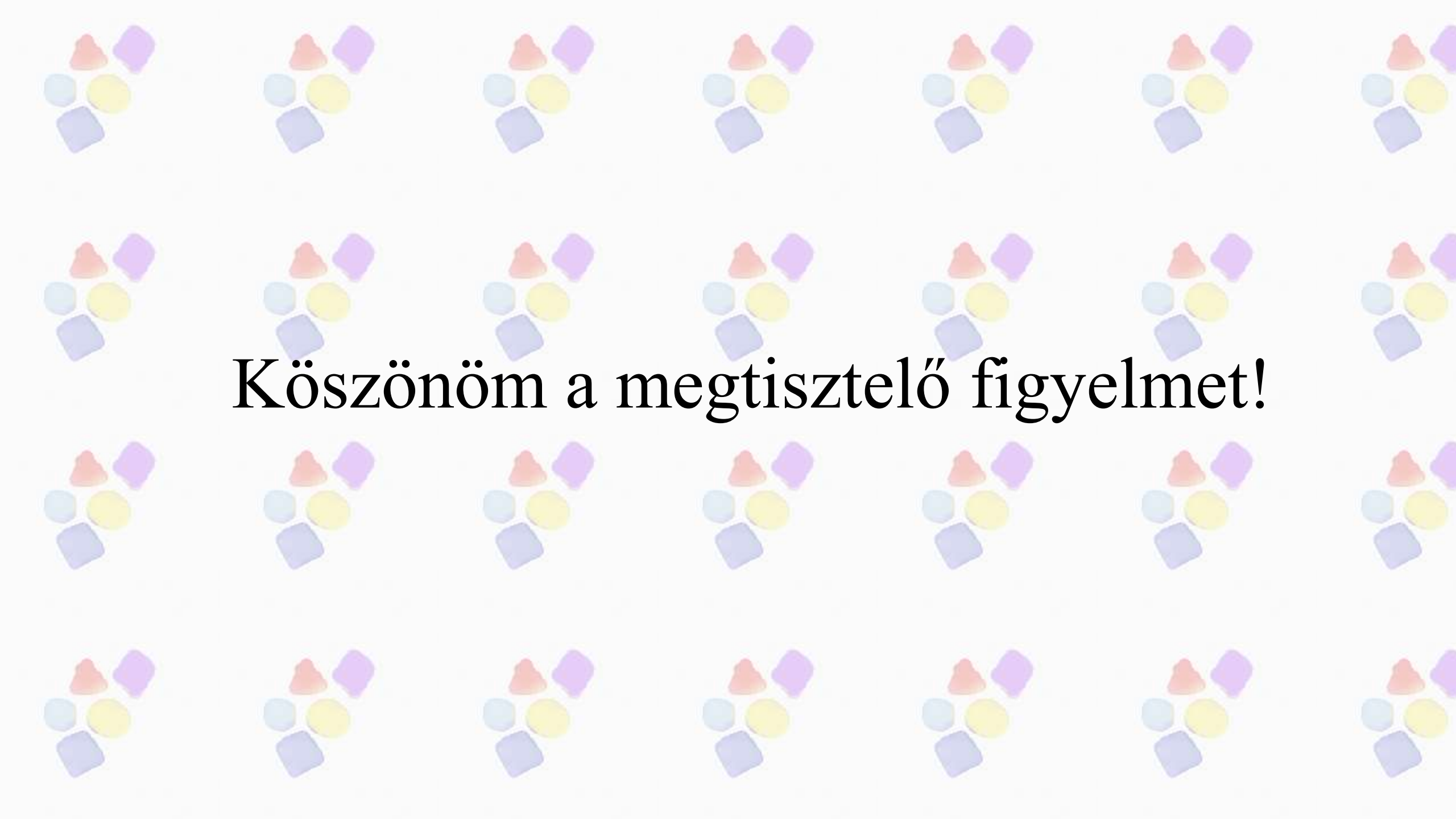
Összefoglalás



Jelenleg zajló kísérleteink



saját illusztráció



Köszönöm a megtisztelő figyelmet!

Köszönetnyilvánítás

Témavezetőimnek: **Dr. Garami András, Dr. Pákai Eszter**

Orvosi Mikrobiológiai és Immunitástani Intézet: **Dr. Kocsis Bélának**

CarboCode, Germany: **Dékány Gyulának**

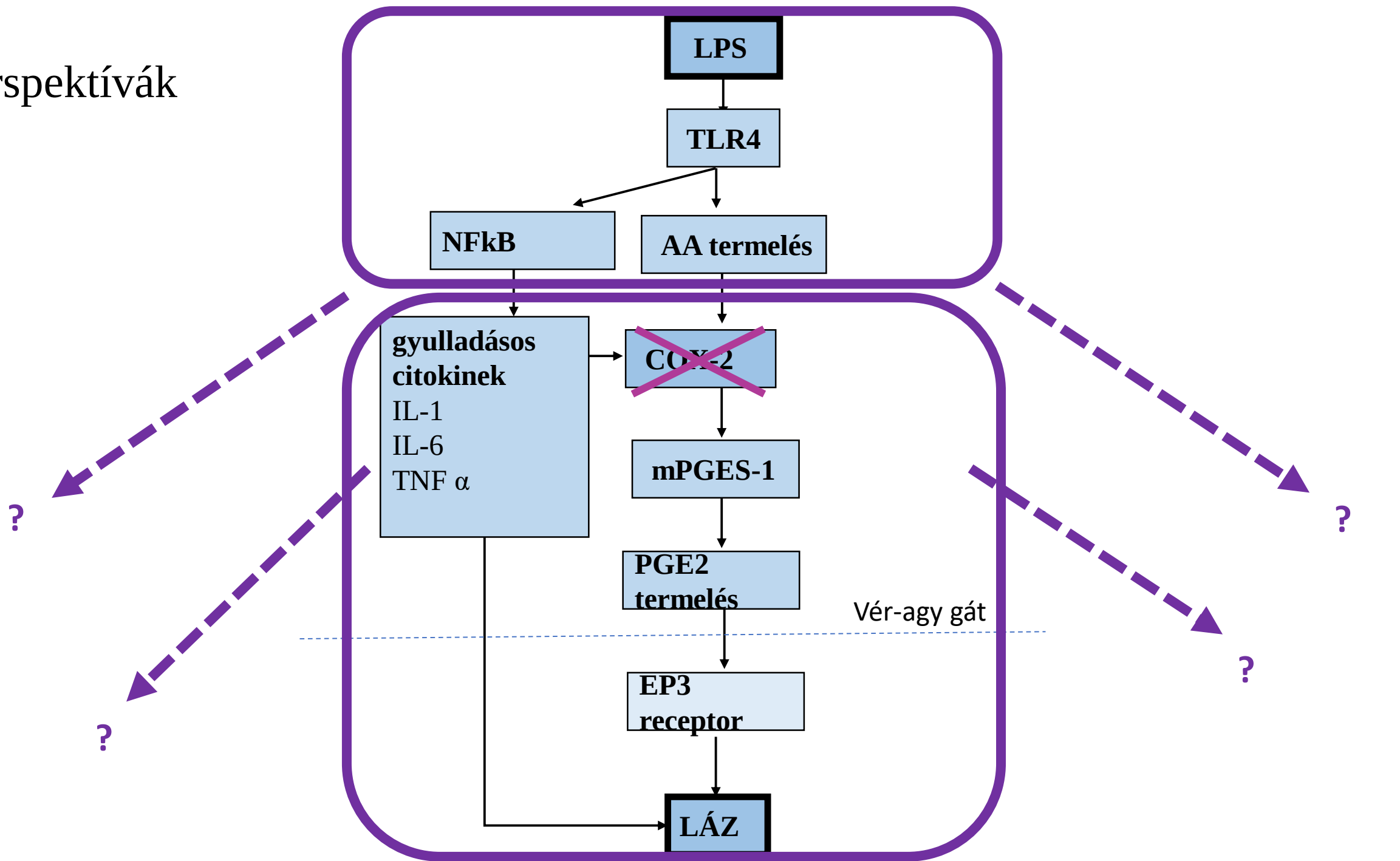
Termofiziológia Tanszék: **Várnagyné Rózsafi Anikónak**
Fekete Katának, Bakos Rolandnak

Saját munka

- projekt megtervezése,
- célkitűzések megfogalmazása,
- protokoll összeállítása
- műtétek, kísérletek elvégzése
- eredmények kiértékelése
- jövőbeli tervek előkészítése
- rajzok, illusztrációk, ábrák,
- fotók készítése



Perspektívák



Felhasznált anyagok

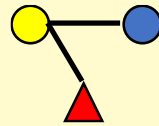
HMO-k

Fukozilált

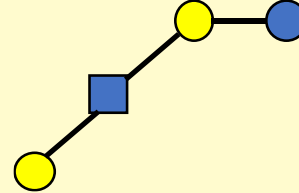
Core

Szialiszt

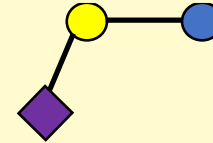
2'FL



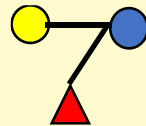
LNT



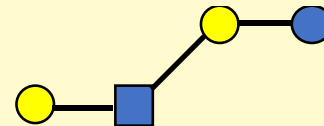
3'SL



3'FL



LNnT



6'SL

